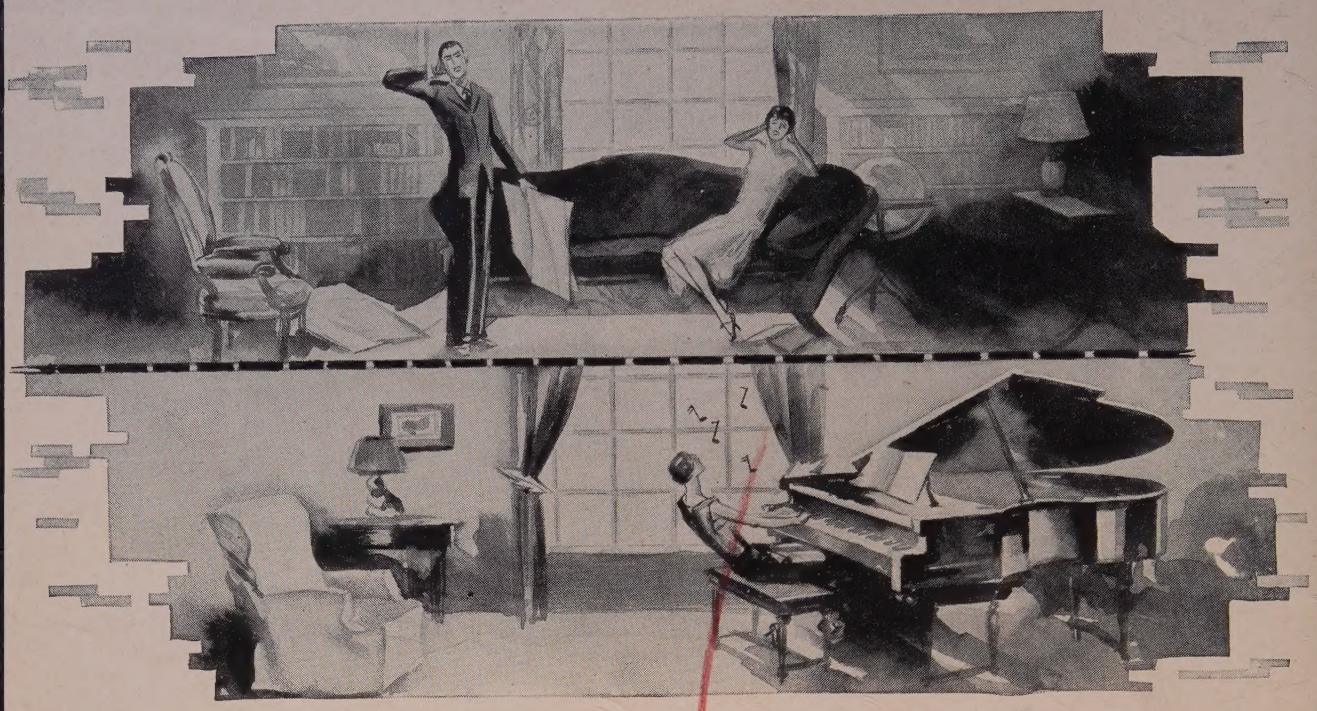
NATURE MAGAZINE

DEC.

1927

Vol. X. No 6.

35 Cents



Don't Sing Scales -Use Silent Method

SURPRISING! Yes, unheard of perhaps to you. Entirely revolutionary to all usual methods of teaching voice. But 30,000 pupils acclaim this new *silent* method and 30,000 pupils tell of astonishing improvements. You will recognize Prof. Feuchtinger's methods as based on sound scientific *facts*. Don't take a chance of ruining your voice by straining at monotonous and tiresome scales. He will teach you to build up the strength and elasticity of your vocal organ through scientific muscular exercise. These exercises are *silent*. You may practice them in the privacy of your room. With surprising rapidity you will notice that your voice is becoming stronger, richer, more beautiful every day.

100% Improvement *Guaranteed!*

Prof. Feuchtinger is a voice teacher who actually guarantees ***results!*** To you, as to every one of his pupils, he says: "I will improve your voice 100% or refund your tuition." Nothing involved about that guarantee. It is so simple and direct that it is astounding. You are to be the judge. If you, yourself, do not think, after completing the course, that your voice has been improved 100%, back comes your money. Send the coupon and get the most inspiring book ever written about voice—actual ***true stories*** of those who have won fame and money as a result of Prof. Feuchtinger's training. The book is ***free*** —it is yours to keep without obligation of any sort. He can do for you what he has done for many thousand others. Send the coupon right now while you are reading these words and you have made the first step toward the voice you've longed for.

Perfect Voice Institute,
Studio 16-79
1922 Sunnyside Ave.,
Chicago, Ill.

Gentlemen: Send at once, free and without obligation, your beautifully illustrated book "Physical Voice Culture," and full information regarding your home study method of voice building. It is understood that I do not have to pay a cent for this book, either now or later, and that I do not have to return it.

Name.....

Address.....

.....

Perfect Voice Institute, *Eugene Feuchtinger, A.M. Director*

1922 Sunnyside Avenue—Studio 16-79—Chicago, Ill.

Too Busy to Buy Books!

The fascinating story of the growth of the BOOK-OF-THE-MONTH CLUB

How 40,000 busy people insure themselves against missing the outstanding new books —and against buying books they do not like.

THERE is hardly a book reader who does not know of the Book-of-the-Month Club. In its first year, over forty thousand of the most notable men and women in the country subscribed to its convenient service. The story of its development is interesting. It grew because busy men and women were forever missing new books they were anxious to read.

The typical subscriber to this unique service had been an inveterate reader. But as his business affairs became more pressing, he lost touch with current literature. Again and again he found that, through pure neglect, he was missing important books that were being widely discussed.

He was disappointed frequently with his own negligence, but realized that it was almost inevitable, because of the driving circumstances of his life. "If," he thought, "there were only some way in which the books I wanted could be sent to my home, I would be sure not to miss them!"

Then he discovered that the Book-of-the-Month Club exactly filled his need—and the enterprise grew because there were so many people like him.

The plan of the Club is simplicity itself. The book publishers send copies of their new books *far in advance of publication* to the selecting committee, which consists of Henry Seidel Canby, chairman; Heywood Broun, Dorothy Canfield, Christopher Morley and William Allen White. Out of the scores of books submitted every month, this committee selects those which it considers outstanding, for one reason or another. All of the month's finest books are listed. And the book which rates the highest in the opinion of the committee, is given the additional honor of being called the "book-of-the-month," and is sent to those subscribers *who indicate that they want it.*

The service costs you nothing

Before this book is sent out, however, a carefully written description of it, and of all the books recommended in the month, is sent to you. If you believe you will like the "book-of-the-month" you let it come to you. If not, you ask for one of the others to be sent in its place. Even then, if you are disappointed with your choice, *you may exchange the book*—at no cost—*for another!*

Could any booklover ask for more? Five authorities, whose opinions you respect, cull out the most noteworthy books for you. You are sent in advance a careful report on all of them. You have the privilege of free exchange, in case of disappointment. Also, the Club's service makes it certain that you *will read* the books you want to read, and that they will be delivered at your home, unfailingly, so that you can't miss them.

And what is the cost of all this? Nothing. *You pay only for the books you receive*, at the same price as if the publisher himself sent them to you by mail.

Send for a booklet which describes this unique and convenient service more in detail. Also get a copy of the current issue of the Book-of-the-Month Club News, which tells what the next "book-of-the-month" is and why, and also reports on other forthcoming noteworthy books. Your request will not obligate you in any way.

HENRY SEIDEL CANBY
Chairman

HEYWOOD BROUN

DOROTHY CANFIELD

CHRISTOPHER MORLEY

WM. ALLEN WHITE

SELECTING COMMITTEE OF THE BOOK-OF-THE-MONTH CLUB, Inc.

39 M

BOOK-OF-THE-MONTH CLUB, Inc.
218 West 40th Street, New York, N. Y.

Please send me without cost, the current issue of the Book-of-the-Month Club News, and also tell me how your service operates. This request involves me in no obligation to subscribe.

Name ----------

Address ----------

City ---------- State ----------

Officers

ARTHUR NEWTON PACK
Princeton, N. J., *President*

CHARLES LATHROP PACK
Lakewood, N. J., *Chairman Board of Directors*

PERCIVAL S. RIDSDALE
Washington, D. C., *Secy-Treas.*

RICHARD W. WESTWOOD
Washington, D. C., *Asst. Secy.*

HARRY E. RADCLIFFE
Washington, D. C. *Bus. Mgr.*

The American Nature Association

Associates

WILLIAM L. FINLEY
Jennings Lodge, Ore.
Director, Wild Life Conservation

DR. E. LAURENCE PALMER
Cornell University, New York.
Director, Nature Education

ANNA BOTSFORD COMSTOCK
Ithaca, N. Y.
Assoc. Director, Nature Education

RUSSELL T. EDWARDS
Washington, D. C.
Director, Educational Publicity

Organized to Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

A Glance Into 1928

MAGAZINES are planned many months ahead and the Editors of *Nature Magazine* have been hard at work planning a program of articles which, they feel, will score an even higher mark of interest and usefulness. A general glimpse of what is to come, at least during the first part of 1928, will be of interest to our members and readers.

One of the most interesting features will be, of course, the material resulting from the American Nature Associations' Expedition to the upper reaches of the Continental Divide. These stories will be illustrated by some of the remarkable pictures taken on this trip, where the shooting was all done with motion picture and still cameras. The articles will be written by our president, Mr. Arthur Newton Pack.

Another fascinating group of stories that will appear with the new year are those by Stephen Haweis, a member of the Smithsonian-Chrysler Expedition to Africa. Mr. Haweis' stories of this trip are different, entertaining and delightfully illustrated.

With the January issue there will be inaugurated a new feature that has been frequently urged by members. A series of practical articles on photography will appear in the main body of the magazine. These will be entertaining and beautifully illustrated, as well as instructive, and to support them there will be a monthly advice department edited by L. W. Brownell. Members are invited to submit their photographic problems to Mr. Brownell.

Dallas Lore Sharp will, of course, be a contributor during 1928, and in his stories, "Stronger Than Death" and "The Wasatch Grizzly", our readers have a treat in store. Ben Hur Lampman will be represented by more delightful Nature essays, and Charles Fitzhugh Talman will contribute more of his fascinating weather articles. Among the other contributors already known to and popular with readers of *Nature Magazine,* will be Marjorie Shanafelt, Lorene Squire, Donald Culross Peattie, Paul Griswold Howes, Edith N. Patch, Hugh Stevens Bell and H. W. Shepherd-Walwyn.

The series of helpful and instructive horticultural articles that have been appearing during this year will be continued during 1928. A remarkably useful group of articles has been arranged, and the monthly department of Hints and Helps for Home and Garden will be continued.

Several authors new to the pages of *Nature Magazine* will make their appearance during the coming year. The regularly printed sky articles, so popular with the amateur astronomers among our members, will be continued by Isabel M. Lewis of the U. S. Naval Observatory and a new turn will be given them during 1928.

A word must be given to the color printing that will appear during 1928. Readers will find the outside covers of the magazine consistently more attractive with the general use of four color covers instead of two colors, permitting even more delightful effects. Each issue will have a frontispiece in four colors instead of an occasional frontispiece as during 1927. In addition, the series of color pictures of birds, mammals, wild flowers and other Nature subjects will appear in each issue. While the subject matter of all of this color production has necessarily been worked out in advance, we will not blunt the enjoyment of our readers by telling more.

During 1928 the American Nature Association will, of course, carry forward its conservation activities in varied fields, extend its Outdoor Good Manners campaign in defense of our roadside beauties and field work.

This can give but a scant idea of the features planned for 1928. We trust, however, that it testifies to the sincere wish of the officers of the American Nature Association and the Editors of *Nature Magazine* to make our publication all that it is humanly possible to make it in its chosen field.

The Day-Dreamer

Will he ever wake up?

HIS life is made up of rosy visions.

He sees himself in a manager's office—as the president of a firm—with a $20,000 salary—perhaps even as a millionaire with a Rolls Royce, a rakish yacht and a swell country estate.

But all this grandeur is in his day dreams. He lives in the golden **PARADISE OF TOMORROW**—and it never comes.

He does nothing with the opportunities that surround him **TODAY.**

He feels above his present job. He is always "going to find a place where his abilities will be appreciated." But he **NEVER DOES.**

He is the despair of his employers, for they know that he **REALLY HAS ABILITY.** He can plan with intelligence, he has original ideas, imagination. If he could only concentrate on today, instead of **TOMORROW,** he might have all the prosperity he craves!

What he needs is a **STICK OF DYNAMITE**—anything to wake him up and teach him to get results from his abilities **NOW.**

If he doesn't give himself a rousing jolt, he will complain more and more of not being "appreciated"—and gradually "peter out" into a failure—**A JOB COWARD**—a cog in a business machine.

He will always be somebody else's servant, instead of master of his own destiny.

How does he get into such a mental state? Because he uses only about **ONE-TENTH** of his mental energies in doing the vital things that count. Psychologists have proved that most of us use **NINE-TENTHS** of our brain power in day-dreaming, fortune-wishing, aimless time-killing. We are nearly all victims of the vicious habit of living far below our God-given endowments!

It doesn't help to learn that certain of your mental abilities have become **WEAK THROUGH DISUSE,** just as unused muscles do. Nobody knows better than you (if you are honest with yourself) that there must be a "screw loose somewhere." The proof of it is that you have failed to reach the high mark you **ONCE** set for yourself.

You admit it. What you want to know is, **WHAT CAN BE DONE ABOUT IT?**

There is one very simple thing that you **CAN** do—now. You can find out what Pelmanism has done for 650,000 men and women, some of whom were facing **THE VERY SAME DISSATISFACTION** with their attainments that you are feeling. Pelmanism developed the mental powers they lacked—it replaced procrastination with "do it now" efficiency; it put concentration in the place of mind-wandering; it substituted self-confidence for self-distrust. You will learn how Pelmanism has often awakened abilities which the individuals did not **DREAM** they possessed!

Since Pelmanism is the science of applied psychology, it brings **SELF-REALIZATION** to all classes and conditions of men and women—prominent and famous as well as obscure and unknown. And among the better known persons who use and advocate it are:

T. P. O'Connor, "The Father of the House of Commons"

General Sir Robert Baden Powell, Founder of the Boy Scout Movement

Judge Ben B. Lindsey, Founder of the Juvenile Court, Denver

Frank P. Walsh, Former Chairman of the National War Labor Board

Jerome K. Jerome, Novelist

General Sir Frederick Maurice, Director of Military Operations, Imperial General Staff

Admiral Lord Beresford, G.C.B., G.C.V.O.

Sir Harry Lauder, Comedian

W. L. George, Author

Baroness Orczy, Author

Prince Charles of Sweden

—and hundreds of others of equal prominence.

A remarkable book called "Scientific Mind-Training" has been written about Pelmanism. **IT CAN BE OBTAINED FREE.** Yet thousands of people who read this announcement and who **NEED** this book will not send for it. "It's no use," they will say. "It will do me no good," they will tell themselves. "It's all tommyrot," others will say.

But if they will use their **HEADS,** they will realize that people cannot be **HELPED** by tommyrot and that there **MUST** be something in Pelmanism, when it has such a record with 650,000 different individuals, and when it is endorsed by the kind of people listed above.

If you are made of the stuff that isn't content to keep on "putting off" all the good things of life—if you have a spark of **INDEPENDENCE** left in your soul, write for this free book. It tells you what Pelmanism is, **WHAT IT HAS DONE FOR OTHERS,** and what it can do for you.

The first principle of **YOUR** success is to do something radical in your life. You cannot make just an ordinary move, for you will soon again sink into the mire of discouragement. Let Pelmanism help you **FIND YOURSELF.** Don't put it off. Mail the coupon below now—now, while your resolve to **DO SOMETHING ABOUT YOURSELF** is strong.

THE PELMAN INSTITUTE OF AMERICA
Approved as a Correspondence School under the laws of the State of New York
71 West 45th Street Dept. 125-C New York City

The Pelman Institute of America
71 West 45th Street, Dept. 125-C
New York City

I want you to show me what Pelmanism has actually done for over 650,000 people. Please send me your free book, "Scientific Mind Training." This places me under no obligation whatever.

Name .....

Address .....

City ..... State .....

MOTION PICTURES AND ILLUSTRATED

LECTURES

on

Nature Subjects

and the

Great Out-of-Doors

Inquire of EXTENSION DEPARTMENT

AMERICAN NATURE ASSOCIATION

15 Boudinot Street, Princeton, New Jersey

Spectacular Motion Pictures of Wild Life

William L. Finley

who is generally acknowledged to be the most successful photographer of American wild animals and birds will lecture during the season of January 1 - May 1, 1928.

Wherever Mr. Finley has lectured in the past his moving pictures have been acclaimed as the most remarkable ever seen.

Wild Animal Outposts—a motion picture story and lecture on Alaska and the Bering Sea—sea birds, foxes, bears, and all the magic of the great northland, also

Travels in the Land of Fear—the kind of wild animal picture you will never forget—the kind which only Mr. Finley can produce.

Every Club or School Lecture Program Should Include These

Dates for the coming season may still be arranged by addressing

Extension Department, American Nature Association, 15 Boudinot Street, Princeton, New Jersey

Wild Life Adventures

by Howard H. Cleaves

Mr. Cleaves is now on the coast of the Canadian Labrador. He will remain in the field more than three months taking photographs and motion pictures of the birds and other life of that region. This is the country visited by John James Audubon nearly one hundred years ago.

Articles for Nature Magazine telling of his Labrador experiences will be prepared by Mr. Cleaves and his new lecture *Cruising the Canadian Labrador* will be ready Nov. 1st. Mr. Cleaves offers also *Outdoors in the West, Birds of the Atlantic Coast* and other illustrated lectures on wild life adventure and travel. For terms and information address: *Extension Department,*

AMERICAN NATURE ASSOCIATION
15 Boudinot Street Princeton, N. J.

GROUND SQUIRREL AT NATURE'S DINING TABLE

THE AMERICAN NATURE ASSOCIATION

PRESENTS

GUY C. CALDWELL

Rocky Mountain Guide

In Nature Programs de Lure

Illustrated by motion pictures, autochrome plates and hand painted slides.

NEW PROGRAMS AVAILABLE

The Call of the Rockies
Trees in their native haunts
Bird Songs and Wild Flowers
Autochrome studies of the Rocky Mountain region

Mr. Caldwell imitates some 200 bird songs and calls by natural whistling. Last season he delivered 135 programs to delighted audiences. "The most beautiful program we have ever had" was the usual comment.

For lecture engagements address
EXTENSION DEPARTMENT
AMERICAN NATURE ASSOCIATION
15 Boudinot St., Princeton, N. J.

For Bird Students

Undoubtedly a long-felt want will be met by *A General Ornithology Laboratory Notebook*, by A. A. Allen, L. A. Fuertes and M. D. Pirnie, recently brought out by the Comstock Publishing Co., of Ithaca, New York. The notebook includes, in addition to blanks for keeping records of birds in the field and for making laboratory notes from skins, a number of most useful sections. Among these are charts useful in teaching, the topography of the bird, feather tracts, a skeleton and the parts of feathers. Splendid, typical outline drawings are provided, together with a list of the names of the parts represented, the student's tasks being that of associating the names given with the pertinent parts in the drawings. In addition to this section, which deals with the house sparrow, there is provided a useful key to the orders of the North American birds and a most splendid key to the common summer-resident birds of Northeastern North America. This is most profusely illustrated with over fifty half-tones. A set of migration data for the birds of Central New York will also prove useful to students of this region. The remainder of the book is devoted to record charts providing easy opportunity for recording important notes on a large number of common birds. Outline maps of North and South America offer opportunities for recording winter and summer range of the birds considered. The book is of a loose-leaf nature and may be made up to suit the needs of practically any part of the country. E. L. P.

National Park Glimpses

Our National Park Service has brought out the bulletins on each of the National Parks, giving directions and interesting data about them. Now comes a new bulletin entitled *Glimpses of Our National Parks* that should be of interest this winter while you are planning next summer's vacation. This booklet compresses the data about the parks within small compass and touches upon some of the outstanding features of these wonderful playgrounds. A copy will be mailed on request to the National Park Service, Department of the Interior, Washington, D. C.

Pennsylvania Weeds

Dr. E. M. Gress, State Botanist of Pennsylvania, is the author of a valuable bulletin brought out by the State Department of Agriculture under the title of *Pennsylvania Weeds*. The bulletin discusses the economic significance of weeds, their classification, their individual characters and their control and eradication. Although not stated on the pamphlet, we assume that it is available free on request to citizens of Pennsylvania at least. The bulletin number is 448.

High adventure in Alaska!

Connie Morgan and Waseche Bill, favorites of AMERICAN BOY readers, come back in December in a thrilling four-part serial of the Alaskan trail. Broke but undaunted, Connie and Waseche become gold prospectors again. They face blizzards, treachery and grim death in the madly exciting Donegal stampede. Drive with Connie and his team of huskies! Don't miss "Connie Morgan Hits the Trail."

More Nerve-tingling Air Stories—"Barrett of the Air Police," by Thomson Burtis. The world in 1980! Great airliners! A gigantic plane that can go from New York to Chicago in less than two hours! You will go on a perilous quest after a mysterious crook who threatens the safety of the airlines of the world.

The Man Who Laid a Trap, by Laurie Y. Erskine. Douglas Renfrew, Royal Flying Corps Captain, has the hazardous task of ferrying an Allied spy across the lines, to German territory.

Another Airplane Model Article. You'll learn, in December, how to build the indoor duration model—the airplane with which students of Mr. Merrill Hamburg, model plane expert, have set world's records for indoor flying. An especially valuable article for model plane enthusiasts who look forward to entering contests or giving exhibitions.

The Tragedy in the Rue St. Guillaume, by John A. Moroso. A Paris street. The round-eyed detective Jim Tierney on one side. On the other, Cockney Willie Madden, henchman of the international crook, Silent Mr. Forrester. Between them an avenue jammed with swirling traffic, shrilling with nerve-wracking, high-pitched taxi-toots! A story loaded with laughs and thrills.

Carney Comes Home for Christmas, by York. Nat Carney, deep in the South American jungles, runs the gauntlet of a bloody revolution in an effort to get home for Christmas. Find out what happens when Nat suddenly comes face to face with the leader of the revolution on the embattled slopes of Santa Rosa! A great Christmas story!

Don't miss this big month—Another laughable story *by Ellis Parker Butler.* "Tamerlane," *by Bigelow Neal,* a story of two great bulls out on the western plains. "Blizzard Lights," *by James Earp,* a story of a student brakeman, packed with grins and ending with a wallop. Many other stories full of excitement, laughs, and adventure in THE AMERICAN BOY for December. A year full of exciting reading follows.

Subscribe today! Clip and mail the coupon below!

20c a copy at all news-stands. $2.00 a year by mail. Two years for $3.00. Subscribe for two years and save a dollar.

The American Boy

THE SPRAGUE PUBLISHING CO.
No. 209 American Bldg., Detroit, Mich.

Enclosed find , for which send THE AMERICAN BOY for year , beginning with the current issue, to

Name_____

Address_____

Canadian postage, 25c per year extra
Foreign postage, 50c per year extra

Save Your Eyes

Dr. C. W. Trail says: — *"When I am not using the Farrington, my wife is using it; when my wife is not using it, our 8-year old daughter is using it. Every home should have at least one."*

At last—a Long Felt Human Want is Filled by this great necessity—Dr. Farrington's portable

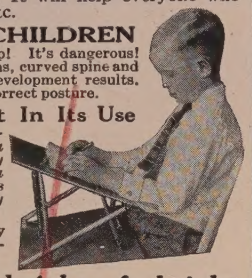
Reading Table for the Lap

Conserves the Life of Your Eyes

Here is the helper you have always needed. It saves your eyes—conserves your energy—insures correct posture—prevents eyestrain—permits concentration with **real relaxation** and absolute comfort. The FARRINGTON supports books, magazines, reading matter, typewriter, writing materials, etc., **at just the right angle to insure correct vision,** regardless of position. It will help everyone who reads, writes, draws, etc.

IDEAL FOR CHILDREN

Don't let your child hump! It's dangerous! Eyestrain, distorted organs, curved spine and retardation of normal development results. The Farrington compels correct posture.



Students Delight In Its Use

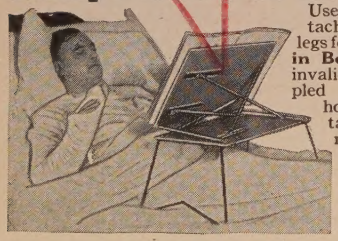
Prof. E. L. Eaton, University of Wis., says: "*It is a joy to read a book of any size, resting easily in a rocking chair. Thousands will now have a new joy reading while resting.*"

With the Farrington every one can increase their capacity for mental effort.

Sit right—read right—feel right

Think what this means! Comfort, enjoyment, greater mental and physical energies. Greater facility for the mechanics of reading and writing. **Genuine relaxation.** The Farrington allows you to assume a comfortable position when reading, writing, etc.

Indispensable to Invalids



Used with detachable metal legs for **Reading in Bed** by sick, invalid or crippled patient in home, hospital or sanitarium. Used on beach or in the camp for eating, cards, etc.

Ideal Gift Usable in so many ways, it will give many years of joyful service. Beautifully finished. Light weight (less than 48 ozs.) sturdily constructed, portable, folds to 1 inch. Size 12x18 inches. A handsome piece of furniture adjustable to any position.

Styles and Prepaid Prices

1. Natural Finish $6.50
2. Walnut Finish 7.50
3. Mahogany Finish 7.50
5. Genuine Walnut 9.50
6. Genuine Mahogany 9.50

FOLDED

Note: Special detachable legs for reading, writing or eating in bed as shown above $1.00 extra.

Order Now on 5 Days' Trial Just tell us the style desired. Your "Farrington" will be shipped promptly, prepaid everywhere in U.S.A. Use it for 5 days. If you're not delighted, we will refund your money. Just enclose your check or instruct us to ship C.O.D. **STATE STYLE DESIRED.**

The Farrington Company
21 W. Elm St.
Dept. N. M.1
Chicago
Illinois

Products of the Forest

In its first edition a valuable and widely-used volume, *Forest Products, Their Manufacture and Use* by Nelson Courtlandt Brown of the New York State College of Forestry is, perhaps, a still more valuable volume in its new and revised edition. It has just come from the presses of John Wiley and Sons. Since the first appearance of the book eight years ago this country has taken strides forward in its appreciation of the importance of the forest, the need of its protection and regeneration and general public knowledge of the forestry situation that confronts us. Forestry is becoming a question of discussion and study in our schools and in this connection Professor Brown's book is invaluable as a reference text. It is a volume that should be on the shelves of every public library. The author has expanded his work and brought it up to the moment in many details. It is listed at four dollars. R. W. W.

Training the Dog

Another volume has been added to the dog series being brought out by the Judy Publishing Company of Chicago, the subject this time being *Training the Dog.* Chapters are given to a discussion of general dog psychology and the principles of dog education, and then the book proceeds to various tricks and services that the dog can be trained to perform. The author is Will Judy, and as a dog lover he has put much sincerity and sentiment into what is, in the main, an instructional book. The author dedicates his volume to "Judge Judy, a smooth fox terrier who was the first dog I owned, who liked fun and play and life, who was clown, guard, companion and friend, and who was everything a dog should be." The book sells for $1.50.

R. W. W.

Smithsonian Leaflets

An interesting group of bulletins of the Smithsonian Institution have recently come from the government printing office and are now available. Dr. Austin H. Clark is the author of an interesting report (No. 2901) on *Fragrant Butterflies,* which develops the thought expressed in his first prefatory sentence, where he says that "surprisingly few naturalists seem ever to have noticed that the males of many butterflies give off a pleasant fragrance similar to and rivaling in attractiveness that of the scented flowers." Vernon Bailey is the author of a report (No. 2895) based on long study and entitled *How Beavers Build Their Houses.* Other recent publications include: William Bateson (No. 2909) by T. H. Morgan; *The National Park of Switzerland* (No. 2906) by G. Edith Bland; *Our Heritage from the American Indians* (No. 2899) by W. E. Safford; *The History of Organic Evolution* (No. 2892) by John M. Coulter; *Barro Colorado Island Biological Station* (No. 2893) by Alfred O. Gross; *Cold Light* (No. 2886) by E. Newton Harvey; *Influences of Sun Rays on Plants and Animals* (No. 2881) by C. G. Abbot.

Can You Clear the Mental Hazards of Middle Life?

Why do so many minds "snap" after the age of forty? Can't something be done to prevent it? Read the answer to this timely question as set forth by Dr. Clifford B. Farr in the December number of HYGEIA, the health magazine of the American Medical Association. He has some excellent advice to give on mental health.

Electrical Treatments

That treatment by electricity can be as dangerous or as useful as fire, is the contention in this article on facts and fallacies about electro-therapy.

It Hurts!

Why an attack of pain may be one of the kindest things that ever happened to you is explained in, "It Hurts!" a most interesting article on pain as nature's cry for help.

Is the Male Inferior?

The author of this article is a man, who makes out a case for the constitutional superiority of the female of the human species. Find out why, in the December HYGEIA.

The Dangers of Tattooing

How tattooing is done, why it spreads disease, how it can be removed, is told in this fascinating article. Pictures of men and women amusingly tattooed illustrate it.

Health Posters in Color

Posters from China, India, Germany, France, Russia, reproduced in their original colors will appear in HYGEIA for December as our Christmas gift to readers. With these drawings will be an article by Dr. S. B. Blakely on prenatal and child care.

These are only a few of the major features for the big Christmas number, but they are typical of the practical, authentic articles appearing every month in HYGEIA. Here is a special offer which will bring you six valuable issues for only one dollar! The yearly rate is $3.00. Send the coupon today, as the offer is limited.

6 Months for $1.00

AMERICAN MEDICAL ASSO.
535 N. Dearborn St.
Chicago

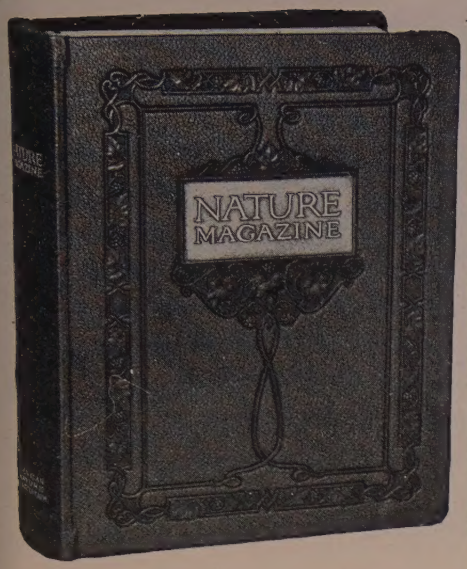
Please send me a 6-months' introductory subscription to HYGEIA for the dollar I am enclosing.

Name.....

Address.....

.....

ND



A New Binder for Nature Magazine

Every number of NATURE MAGAZINE is worth reading again and again. For your convenience and pleasure, we have secured an entirely new binder for copies.

Grasp this opportunity for greater enjoyment from your magazines—bind them in our special two-tone, hand colored cover, embossed in gold and they will be preserved to give you a lifetime of enjoyment.

Many requests make it possible for us to offer you these artistic, leather-like covers, pictured above, especially created for our members, in which you can insert each issue, as you receive it, in a half minute, without any punching or other annoyance to try your patience.

EACH BINDER WILL HOLD TWELVE ISSUES AND IS GUARANTEED. YOUR MONEY REFUNDED IF YOU ARE NOT MORE THAN PLEASED.

$2.00 each

Regardless of number ordered. Postage prepaid to any part of the United States. For foreign or Canadian cities, add 25 cents for postage on each binder.

American Nature Association
1214 Sixteenth St., N. W.
Washington, D. C.

MAIL THIS COUPON—PRINT PLAINLY

THE AMERICAN NATURE ASSOCIATION
Washington, D. C. Date.....

Send me ..... Distinctive covers for NATURE MAGAZINE, for which I enclose $..... If I am not unusually pleased I will return them to you within 5 days, and my money will be refunded to me.

Name.....

Street .....

City and State .....

New Directory Out

For the convenience of game authorities, bird-protection organizations, and others in procuring information concerning game and game laws, the twenty-eighth annual *Directory of Officials and Organizations Concerned with the Protection of Birds and Game,* compiled by Talbott Denmead, deputy chief United States game warden of the Biological Survey, has been issued by the Department of Agriculture as Miscellaneous Publication No.6-M. Copies of the directory may be obtained, while the supply lasts, by applying to the United States Department of Agriculture, Washington, D. C.

Arbor Day Lady

Calculated well to inspire affection for trees and to encourage in the youngsters the idea of protecting and planting them, is a little book entitled *The Arbor Day Lady* by Mary L. Hellings. It is a book of original and reprinted poems interspersed with some brief and simple advice on tree planting. It is decorated and illustrated interestingly by Ethel Schacherer. The little book, which is published by Albert Whitman and Company of Chicago, should be specially useful in connection with school and organization Arbor Day programs and elementary school work along forestry lines. It makes an attractive gift, as well. The book is listed at seventy-five cents.

Cloister Chords

Although essentially a Christmas message, the little booklet *Cloister Chords* by Sister M. Fides Shepperson, Ph.D., of the Pittsburgh Sisters of Mercy, is an inspirational little document of no mere seasonal value. From the cloister the author sends words of kindness and love of the wild world and the thoughts she expresses in this small volume are fine and lasting thoughts. It is published by the American Humane Association, 80 Howard St., Albany, New York, and sells for 10 cents a copy or 13 for one dollar.

Beaver Habits

The beaver has come in for considerable publicity of late in several fine volumes and reports on its activities. This collection of titles is also graced by a new technical bulletin (No. 21) of the United States Department of Agriculture by Vernon Bailey. It is entitled *Beaver Habits and Experiments in Beaver Culture.* This is sufficiently descriptive of the material contained in the pamphlet, which points out that there are many places where these fur-bearers could be reintroduced without harm and where through storing water in the reservoirs along mountain streams, they would do much good by helping prevent floods and extensive erosion, by increasing the stream flow in dry weather, and by improving the fishing resources of streams and lakes. It also considers the possibilities for profit in beaver farming. A copy may be obtained on request from the Department of Agriculture.

Indian-detour

A new kind of trip to the land of "In a little while"

Three days of motoring in luxurious Harveycars—overnight at delightful hotels. 300 miles through a strange country—peopled by a strange race. Traveling in Time 20 centuries back—and more—for the history of the Forgotten People no man knows.

A courier acting as hostess and guide travels with each Harveycar—a young woman who knows the Indians and the country—its history and its fascinating lore.

She will tell you that the mountains of a strange red glow against the sky, which seem to quiver in the sunset light, are the Sangre de Cristos—meaning the Blood of Christ. She will introduce you to her ancient Indian friend, Kit Carson's last scout. She will tell you the tales they tell—the archeologists—of the cliff dwellers who lived in the honey-combed wall of Puye on the Pajarito Plateau.

You'll want more than three days in this land of mystery and delight, so arrange if you can for extra time to take some of the special side trips—to Taos—to Acoma, the Sky City—to Los Frijoles.

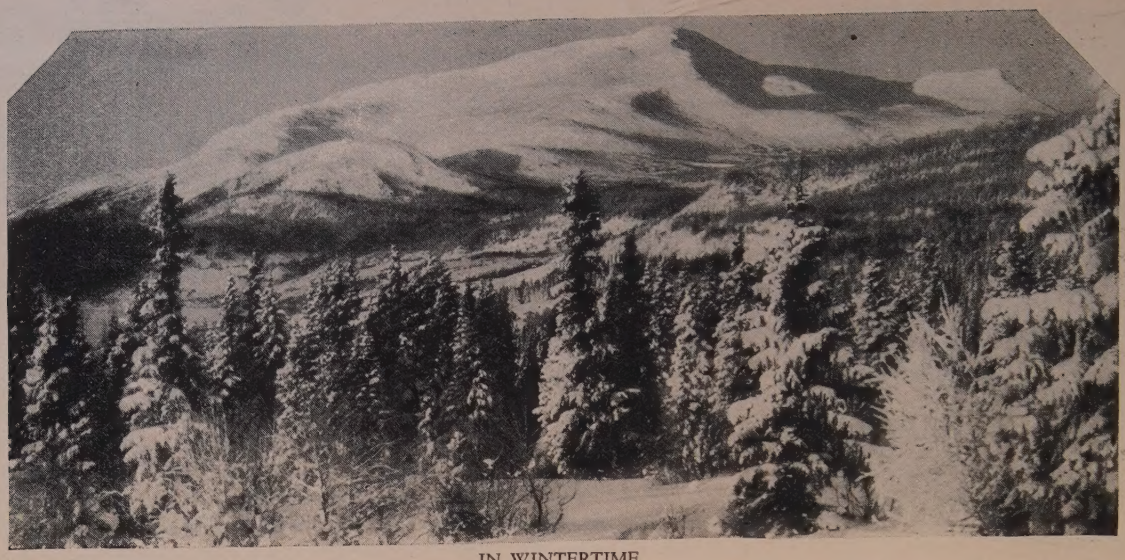
And $50 covers all expenses! A pleasant way to break the train trip across the continent. Fill out the coupon and we'll be glad to send you complete information.

Santa Fe
Harveycars

W. J. Black, Pass. Traf. Mgr.
Santa Fe Sys. Lines
1007-A Railway Exchange, Chicago, Illinois
Please send me free picture folder about the Indian-detour and Roads to Yesterday.

Name_____

Address_____



IN WINTERTIME

NATURE MAGAZINE

PUBLISHED BY

THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

PERCIVAL S. RIDSDALE, *Managing Editor*
ARTHUR NEWTON PACK, *Associate Editor*
RICHARD W. WESTWOOD, *Chief Editorial Staff*
R. BRUCE HORSFALL, *Artist*
EDWARD A. PREBLE, *Consulting Naturalist*
HARRY E. RADCLIFFE, *Business Manager*
GARNET W. JEX, *Assistant Artist*

Scientific Consulting Board

DR. L. O. HOWARD, Senior Entomologist, U. S. Bur. of Entomology
DR. HARRY C. OBERHOLSER, Biologist, U. S. Biological Survey
HENRY O'MALLEY, U. S. Commissioner of Fisheries
C. W. GILMORE, Curator of Vertebrate Paleontology, U. S. National Museum
DR. WALDO L. SCHMITT, Curator of Marine Invertebrates, U. S. National Museum
VERNON BAILEY, Chief Field Naturalist, U. S. Biological Survey
DR. PAUL BARTSCH, Curator of Mollusks, U. S. National Museum
DR. EDGAR T. WHERRY, Wild Flower Preservation Society
T. GILBERT PEARSON, Nat. Assoc. of Audubon Societies
DR. WILLIAM M. MANN, Director, Nat. Zoological Park

$3.00 a Year

35c a copy

TABLE OF CONTENTS

December, 1927

THE TWENTY-THOUSAND OF JACKSON HOLE — *Carra E. Horsfall* — 351
THE SOAP-SHAKER GRADUATES — *S. Harmsted Chubb* — 355
THE WHITE-LINED SPHINX — 356
SHRUBS WITH WINTER BERRIES — *Stephen F. Hamblin* — 357
FRIENDLY ENEMIES — *A. B. Champlain* — 359
IN UNION STRENGTH — *E. H. Mears* — 361
SUPER-DOG OF THE NORTH — *Frank Dufresne* — 362
A NATURE PUZZLE — *Florence H. Moore* — 364
LANDSCAPE AND THE HOME — *Bradford Williams* — 365
A WILD FRIEND — 369
CARLSBAD THE MAGNIFICENT — *Hugh Stevens Bell* — 370
OUR DISAPPEARING FUR BEARERS — *Edward A. Preble* — 375
ANGEL OF THE CHRISTMAS TREE — *Tom Gill* — 382
"FORMICA TRANSPORTATION CO., LTD." — *H. T. Oberg* — 385
MY FRIEND "AKE" — *C. L. Dewey* — 387
HINTS AND HELPS FOR HOME AND GARDEN — 392
ARIES AND DECEMBER'S SKIES — *Isabel M. Lewis* — 394
NATURE EDUCATION — 398

Nature Magazine, past and present, is indexed in the Reader's Guide in your library.

NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter May 31, 1927, at the post office at Washington, D. C. Additional entry at Greenwich, Conn.

Subscribing Membership Blank will be found in the back pages of the magazine.

Publication and Editorial Office, 1214 16th Street, N. W., Washington, D. C.
Chicago Advertising Office, 25 North Dearborn St.

Copyright, 1927, by American Nature Association

Additional Offices of Publication, Greenwich, Conn.
New York Advertising Office, 171 Madison Avenue.
Title Registered U. S. Patent Office

NATURE CALENDAR

DECEMBER

by E. Laurence Palmer

JOEL Chandler Harris who was born in December gave many of us an early interest in Nature through his stories about Br'er Rabbit. Later we learned from Seton about Mollie Cottontail, and then Burgess came forward with Peter Rabbit. By whatever name we may have known the cottontail it has been just as interesting. It has been characterized as possessing great cleverness and as being extraordinarily timid and silly. In many parts of the country rabbits are studied most easily in this month. You can trail them through the cornbelt region to where they sit crouched under a clump of grass. In the East they seem to hug the hedgerows where there is opportunity of nibbling a few frozen apples.

Wherever rabbits are they have a minimum of cover and must depend upon their wits and luck for their safety. If you haven't noticed how their eyes are so placed that they may see in all directions, do so. In some places you may find where they have girdled the bark from trees when their other food has been covered up. You may not infrequently find sumacs girdled six feet or more above the ground and think that this could not have been done by a rabbit because rabbits cannot climb. They do not need to climb when the snow comes along and piles up in drifts raising the feeding rabbit to a higher shelf in the out-of-door lunch counter. This may remind one of the days when we read Br'er Rabbit and climbed for the jam in the pantry.

This topic of deep snow may remind one of "Snow-bound" written by Whittier, who claimed December as including his birthday. What better picture could we ask of one of those days in which everything seems to be snow than that of Whittier when he said, "No cloud above, no earth below,—A universe of sky and snow!" If you cannot read the signs of the beginning of one of these heavy snowfalls from Nature read of them in "Snow-bound" and then look for them in Nature.

While some of us will be watching for things of this sort others in warmer parts of the country will still be watching the leaves fall from the trees. Last December I noticed in California for the first time how peculiarly sycamores shed their leaves, those at the very tip of the year's growth remaining on until the very last. Did you ever notice whether this was true of other trees than sycamore?

December also gave us Dallas Lore Sharp, whom you may have learned to know through Nature Magazine, if not through his writings elsewhere. His little book on "Winter" should make good reading for this month and serve as a guide to your rambles in the fields as well as an inspiration to take such rambles.

In the far West white-crowned sparrows will be darting about the shrubbery as commonly as the tree sparrows will be in the East among the weed patches. Not a few song sparrows may be mixed in with the flocks in each section. One would scarcely recognize in the song sparrows the exuberant birds of the Spring months. No matter how far off Spring may seem these birds are with us ready to recognize its first signs. It is no doubt absurd to assume that these birds hope or plan for the Spring months, but whether they do or not the Spring will come.

Should one feel pessimistic of the long Winter ahead he might profitably read Carlyle, who by the way was born in December. He says in one place, "the cause thou fightest for, so far as it is true, is very sure of victory." "The truth," he says, "cannot be conquered." And so it is with Nature, the facts will not be denied. If we wish to live in harmony with it we must learn and obey its laws. We can evade the penalty of some of the laws by protecting ourselves with others but while we may burn logs in an open fireplace to avoid the cold of Winter we cannot stop its being Winter.

And so December has given us rabbits and snow and birds and storms, and Harris and Whittier and Sharp and Carlyle to help us understand them and philosophize about them. What more may we ask for any month to give us as a Christmas present?

WINTER TIME WITH THE ELK

NATURE MAGAZINE

Volume Ten

No. Six

December, 1927

KING OF THE HERD

The TWENTY-THOUSAND of JACKSON HOLE

by Carra E. Horsfall

"SURE, lady, those are elk horns."

"How did they get in that big pile?"

"Well, you know the bulls drop their horns every year 'n some of us fellers used to gather them for curiosities. Some of these were picked up a long ways from here."

"Are there many elk now?"

"Sure, quite a lot, but they've had a mighty hard time holding their own. You see, lady, they used to have the whole blamed country to range over till humans came this way. Cattle raisin' and sheep grazin' used up a lot of their fodder, then when settlers planted and cut hay crops there wasn't much left for the elk. You see, it's like this, during the summer time they travel about the mountain meadows nipping the grass and tender twigs, the bulls quiet like, letting their new horns grow, the does taking care of the little spotted fawns. Comes a day when the wise ones know it's time to start for the lowlands or they'll be caught in the snow. Snow's not so bad, it's when it gets crusted with ice that the devil's to pay. Then they can't paw it away to get at the grass at all. I remember one winter bad luck seemed to follow them all the way. There'd been scarcely any rain in the valleys all summer so there was no grass to mention. Then came a wet snow and a cold spell, 'n everything jest glistened with ice. Then's when the mothers and their babies starved by the hundreds and even the strong old bulls toppled over."

"Wasn't there anything to be done to prevent such suffering?"

"Not enough. The settlers had their hay all stacked behind pole fences—of course they needed it for their cattle—and the elk couldn't get at it. Many laid right down and died in sight of plenty. But there's a place down in the Jackson Hole country where the government raises some hay to feed the elk that get tame enough to go after it."

Thus the Old Timer whetted the interest of the writer who had that morning travelled from Three Forks over the high rolling plateau country to the Gallatin River road and through the Gateway into the Yellowstone wonderland. Up and down, in and out, among a most interesting series of mountains and valleys we had come, to stop at last at one of the Dude ranches where the huge pile of elk horns had attracted attention.

Constantly uppermost during the afternoon were thoughts of the wild creatures which must find abundant means of livelihood upon the hills and in the

WINTER LEAN TIME
Forage is hard to get when it is under snow

U. S. FOREST SERVICE

valleys which border the Park on the west. It was learned that even yet many sorts of animals may be seen by the person who has the leisure to be deliberate in his mode of travel. Because of the protection afforded them these original inhabitants are not so timid as they were and, though they have not come unhesitantly to welcome automotive vehicles, they are not unduly disturbed by visitors who approach upon the back of a familiar horse, or who stroll quietly about in their favored haunts. The southern part of Yellowstone Park is within the summer range of elk and they may be seen there by those fortunate persons who include this as part of their itinerary.

In times past elk roamed over a far wider and more varied area. Then there was enough for them to eat, even during the most severe winters. But people began to settle, and more and more of the country was used for cattle and sheep, the winter range becoming restricted. Now the animals remaining in northwestern Wyoming are roughly divided into two aggregations that are known as the northern and southern herds. The horns that we had seen were from the northern herd, but the southern herd is better known for many reasons.

The country of the Jackson Hole herd includes the mountains about the broad upland valley of Snake River which extends south from Yellowstone Lake approximately a hundred miles, with the lofty Teton Range to the west and the Wind River Range to the east. This provides an excellent summer home for elk. Here the young are born and carefully hidden by their mothers in some secluded thicket where they remain absolutely quiet when they are left to themselves. They are long-legged, wobbly babies and have the characteristic spotted coat of the deer family. Sometimes they begin to browse by the time they are six weeks old, but usually they are older. During late summer the does with their calves and the yearlings wander among the higher meadows, feeding at an elevation of from nine to eleven thousand feet, while the lords of the herd spend much of their time above timberline. It is during this season that the bulls are taking extreme care of their new horns which are "in the velvet." The soft growing tissue, covered with a veritable fluff of velvet-like substance, is then easily injured. By the end of August this has been rubbed off from the hardened horns and the owners are ready to proclaim and prove their mastery over their own herds. It is then that they utter their strange musical challenge, the "bugle,"—a sound, once heard, forever to be remembered.

U. S. FOREST SERVICE

A BULL ELK "BUGLING"
This strange musical challenge is a sound, once heard, never to be forgotten

When the cool days of autumn come the males gather their families together and head them toward the lower, more sheltered valleys.

ACROSS THE SNOW
A column of elk en route in true military manner

U. S. FOREST SERVICE

Gradually the herds join forces until there is a horde of animals all traveling in the same general direction. Due to the topography of the country they draw closer and closer together and when the fall migration is at its height thousands of elk move en masse into the country to the East of Jackson Lake. If sufficient summer rain has fallen they will find ample grass to eat.

While in the Yellowstone Park and the State Game Preserve, the elk have abundant feed and protection, but the trek into the Jackson Hole country brings them into privately-owned territory which has been reclaimed for homes. Here the lands which formerly best supplied the elk with abundant forage are used to raise hay for domestic stock. Many of the settlers are friendly and willing to cooperate, but when hordes of elk come upon them in the winter, despoiling the fields, breaking the fences and creating havoc generally, they drive them off, either back to the mountains or to the limited, uncertain food supply of the valley beyond.

To protect themselves from these raids, the inhabitants surround their haystacks with high pole fences, literally stockades, because the elk are strong jumpers and can work their way through any narrow opening between poles. Even these high barricades do not keep out all the marauders for King Winter comes to their aid by piling snow against the fences, thus making access easy. Since elk will feed at night, sometimes the only means of protection is for the rancher to sleep beside the stack. Naturally the people cannot afford to tolerate this state of affairs, though kind feelings for the suffering animals are the rule. Then, too, most of them realize that the elk are an exceedingly valuable asset. The possibility of finding these splendid game animals in open country is a sufficient incentive to induce people to come from the far East and the far West to spend days or weeks in their neighborhood. This all means revenue to the dwellers in this wonderful country and, under suitable conditions, the preservation of this native wealth is almost universally favored.

© E. M. BATTEN

MOTHER ELK AND HER OFFSPRING
In times past these beautiful animals were found from the Atlantic to the Pacific Coasts

In the early days of the settlement of North America elk were found from Massachusetts to the Pacific, and from middle Canada nearly to the Rio Grande, equally at home on plains or in forests, at low or high altitudes. Gradually with the settlement and use of the land for agriculture and stock-raising, they were killed off or driven to change their mode of living. Thus, today, they are found only in a small portion of their original range, and have become summer dwellers of the parks and meadows of the high mountains, even above timberline. Here they spend the spring and summer, and many stay until heavy snows force them down to the foothill country. The

FOREST SERVICE
FORAGE ENOUGH
In summer there is grazing aplenty for the hungry elk

fare is sometimes scanty, but they supplement what they obtain by grazing with the tender shoots of aspen, birch and succulent willows. Even so there is seldom enough food to keep the wolf away, literally as well as figuratively, for when, during the winter, the animals are weakened by hunger they are an easy prey to wolves, and even to coyotes who take their toll from the young of the herd.

Since this is the largest remaining aggregation of big game animals in the United States, it behooves the people of the nation to come to the rescue and help to provide for them sufficient unoccupied area by purchase or cooperation. An addition extensive enough to avoid crowding and a foothill resting area should be added to the present Winter Refuge. There must be enough food and range to permit them to hold their own in the conflict with the elements. If it is not feasible to purchase lands and turn them into cultivated ranges which would provide food in a normal manner, it will probably be possible to purchase hay to feed the animals during the more severe winter months. The period of feeding necessarily varies from three weeks to three months, depending upon the severity of the weather and the previous condition of forage. Under normal conditions the animals would be able to survive on the food they could obtain, but during an exceptional winter it becomes impossible for them to get at the scant herbage beneath the snow. Then means of supplying food in suitable places must be assured. In the Jackson Hole region winter food has been provided for the past sixteen years, the United States government cooperating with the State of Wyoming in providing hay, but even with this aid many hundreds of elk have perished from starvation during winters of unusual severity.

Many suggestions have been made as to the best way of solving the problem of the stabilization of the herd. Moving the excess number to other reserves has been tried out in a small scale but without appreciable diminution of the surplus, owing to the great labor and expense of transporting them over the mountains to the railroads. These stockings, however, have resulted in the establishment of dozens of splendid herds in areas where the species had been long exterminated. More liberal open seasons, or even organized killing under controlled conditions have been advocated. However, the latest authentic count shows that at present there are approximately twenty thousand in this region. This is the optimum number agreed upon by the best authorities as needed to prevent deterioration and ultimate extinction of the race, and as possible of maintenance. Since conditions of weather and food are subject to unpredictable change, it is believed that any killing other than that now permitted would be a serious mistake, as it might menace the well-being of the herd. A careful study of all factors affecting the problem, including close observation of the herd by a trained observer throughout the seasons, is now in active operation, and his report should aid in finding a solution.

FOREST SERVICE
A BULL ELK
Many succumb to the rigors of winter and scant food

THESE elk, as well as the country they inhabit, are of nation-wide interest and should be seen by all who have an opportunity. Most of the transcontinental railroads carry passengers to points whence access may be had to this fascinating country by automobile stage or horseback. The Jackson Hole country can be reached,—

Through Gardiner, via the Northern Pacific.

Through Gallatin Gateway via the Chicago, Milwaukee and St. Paul.

Through West Yellowstone via Oregon Short Line.

Through Cody via the Chicago, Burlington and Quincy.

Through Lander and the Wind River Country via the Chicago and Northwestern.

ILLUSTRATED in color and black and white, the first article based on the American Nature Association Expedition atop the Continental Divide will be the feature of the January issue of Nature Magazine. It is a fascinating tale of travel and adventure with the motion picture and still camera as the only weapons. Mr. Pack has written it so that one feels that one is actually making the trip.

Appropriate to the season, the January issue will have another article illustrated by two pages of color pictures, about the winter birds that remain in the northern climates.

Stephen Haweis writes a delightful story of the yellow baboons brought back by the Smithsonian-Chrysler Expedition to Africa; William L. Finley tells us about the interesting ring-tailed cat; Alexander Sprunt, Jr., writes of a trip among a colony of skimmers; L. W. Brownell gives many helpful suggestions to the winter photographers. These are only a few of the interesting features of the January issue.

THE SOAP-SHAKER GRADUATES

By S. Harmsted Chubb

Associate Curator, American Museum of Natural History

Photographs by the Author

THE CAFETERIA IN OPERATION

At the right the white-breasted nuthatch is starting at the bottom and working up

WHEN we go out for a bird walk and set down one name after another we like to think of these titles as representing individuals, but in most cases they really mean only the species we have identified. How much is added to our pleasure when we know that the chickadee which comes to our window today is the same little personality that visited us yesterday and the day before or last week; or when two birds of the same markings can be distinguished by the manners and behavior of the individuals. This intimate and pleasing acquaintance may be gained by careful and attentive feeding.

Those who are interested in such pleasant diversion will find the soap-shaker a most attractive cafeteria for many species of birds. This useful household implement may be purchased at a ten-cent store, or a somewhat better and more durable article can be found at a hardware or department store.

If possible the mesh should be about one-fourth of an inch. Or if your mesh is finer it will serve the purpose fairly well if a single wire is cut out here and there with cutting pliers, taking care to leave no sharp and dangerous ends exposed. If the handle is then cut through on one side it can be conveniently slipped over a small branch or line and cannot be shaken off by the wind. A coat of dark-colored paint will improve the artistic appearance and will, no doubt, be more attractive than shining tin in the minds of the birds. A spring clothes-pin with a slot sawed in the pinching end may be clipped on the line astride the handle of the shaker to keep it in the desired place on the line.

DOWNY WOODPECKER WAITS HIS TURN

That is his favorite soap-shaker cafeteria and he is impatient to eat

I would suggest suspending a number of these swinging larders in the nearby trees or on a pulley line at your window, filling several of them with shelled peanuts for nuthatches and chickadees, and two or three well packed with suet for the woodpeckers.

The soap-shakers are particularly serviceable in localities where house sparrows, the common birds of our city streets, are so abundant as to be a pest. These foreigners do not like to light on a swinging pendulum of this sort and are so awkward and heavy-beaked that they would fare poorly if they ventured to take the chance. Another virtue in this device is the fact that it always serves in any kind of weather,—rain, snow, or even an ice storm.

The chickadee delights in holding on underneath, back downward, working from below; and the nuthatch, like a small boy, welcomes any excuse to stand on his head,

holding fast at the side while he reaches underneath where the treasure is not sealed up even when the top may be covered with ice or snow. They seem to learn that when the shaker is partly empty the peanuts fall to the bottom where the last fragment may be reached.

The accompanying photographs were taken from the window of our New York City apartment where the possibilities of attracting a great variety of patrons is somewhat limited and yet we are enjoying the society of ten species which regularly visit our shakers, the cocoanut "refill," and various other swinging receptacles which dangle from our bird's pulley-line cafeteria.

In more favorable localities red-breasted nuthatches, brown creepers, pine finches, redpolls, hairy woodpeckers, and golden-crowned kinglets would be very likely to discover the charms of the soap-shaker, thus adding pleasure to their days and alleviating, to some extent, the struggle for existence, particularly in winter, and incidentally returning a handsome profit to their benefactors. Best of all, this most menial kitchen utensil may become a wholesome source of inspiration and interest to the rising generation, and an aid to the study of birds.

CORNELIA CLARKE

ONE OF THE MORE COMMON SPHINX MOTHS

They flit from flower to flower seeking nectar, and can sip with their long tongues while hovering in the air

The WHITE-LINED SPHINX

THE WHITE-LINED SPHINX moth gets its name from the light buff-colored stripe on its fore wings. Olive-brown is the general color of the insect with markings of white, pink and black on wings and body. It is about the most common of all the North American members of the Sphinx family, and ranges from the southern part of British America to the Gulf of Mexico, and southward to Central America.

"White-lined," or "striped morning Sphinx" moths, as they are sometimes called, fly from daylight till dark, visiting a great variety of flowering plants in search of nectar. They flit from flower to flower, and with their long tongue can sip up the honey while hovering in the air. A humming sound produced by the rapid vibration of their wings recalls that of the humming bird, and this group, the Sphingidae, are sometimes called "humming bird moths." They are also called "hawk-moths" from their swift strong flight and their rapid darting motions.

The caterpillars that hatch from the eggs laid by the "white-lined sphinx moths" are extremely variable in color and markings. A common form is yellowish-green with a double row of elliptical spots along each side of its upper surface. These spots are tinted with red, yellow and black. There are also darker forms and some almost black.

A great variety of plants furnish food for these caterpillars or larvae. They eat the foliage of apple, grape, plum, currant and many other cultivated varieties, including the cotton plant of the South. No doubt they would do considerable more damage to our gardens and orchards if they did not have a greater appetite for certain weeds. Purslane is a favorite and preferred food plant, a noxious weed to which they are quite welcome.

When the caterpillars are full fed and about three inches in length, they leave the plants and enter the ground. Here they form a smooth cell in which they transform to light-brown pupæ.The winter is passed in the pupal stage. When the proper time arrives in the Spring the skin along the back of the pupa splits, and from this opening a "white-lined Sphinx moth" will emerge to seek the flowers.

FRUIT OF THE
AMERICAN HOLLY

SHRUBS with WINTER BERRIES

by Stephen F. Hamblin

Director of the Harvard Botanic Garden

WHEN leaves have fallen and snow has come to our northern climates, we look for the bright berries of some of the bushes of our fields for cheer and color. Prominent in this group are, of course, the hollies, particularly American, deserving of wider cultivation and of waning abundance because of the reckless gathering that has marked their going. The true American holly, *Ilex opaca,* is the chief favorite, our only evergreen holly with red berries and prickly leaves. It is difficult to transplant and little sold by nurseries, and with the rapid depletion of its numbers will soon be in a class with the buffalo,—a captive in parks and reservations.

A similar tree is the English holly, *Ilex aquifolium,* commonly cultivated in states with mild winters. Its leaves are more shiny and the spines of the leaf edges are larger and sharper. Also for holly berries we have several deciduous shrubs of abundant red fruits, and for evergreen foliage we can borrow from other plants for holiday use. Any back yard that will grow our common shrubs will raise these berries, and as the holly berry shortage increases we should grow them more and more. Even florists, finding the natural source in the fields and swamps becoming depleted, have taken to growing them as a crop and sell them by the number of berries per twig. There are some five American species of red-berried deciduous hollies.

THE HOLLY TREE
It is really a tree rather than a shrub, and a lovely one

By far the most abundant, universal and prolific is the common winterberry or black alder, *I. verticillata.* For Christmas use in the northern states this is the source of most of our red berries. Winterberry is a good name for it, but black alder is not so obvious. Yet it grows in and near the swamps with the alders, and like all deciduous hollies,—and some of the evergreen ones,—its leaves turn black on drying. In fact, the leaves of some of our southern species and those of our tropics are used as tea.

Our northern bush is very erect, many branched, with dark smooth bark. As it makes a dense clump of stems, cutting it severely for its winter bouquets inflicts no permanent harm. Most of the year it is a commonplace bush, unnoted among other shrubs. Its leaves are alternate, simple, finely toothed, broadest at the apex, but not unusual. The fact that the foliage turns black at first frosts is its surest identification. The little green-white flowers in May and June are too retiring to be

noted, but they are important, for from these the red berries evolve in autumn and winter. Sad to relate the plant usually has two sexes, and only the female plant bears berries, though both are necessary. Some shrubs never bear fruit, and to be sure that you get both sexes mark them when in fruit in autumn before digging them. One male bush is enough for a planting of a dozen or more of the berry-bearing sex. Apparently some bushes set fruit from their own pollen, both sexes being present, for a clump widely isolated from other plants often is loaded with berries.

The fruits are dark red, of much the size and substance of those of the evergreen holly, but set close on the leafless twigs, for the first hard frosts have killed the leaves and the berries shine out in glory. They are not eaten by birds, and if not plucked for Christmas use will stay red until mid-winter; but winter thawings finally cause them to blacken and fall.

The bush ranges throughout North America east of the Mississippi, and though found in moist soil it is easily grown in any soil suited for gardening. The old clumps may be divided easily, and unlike the evergreen kinds it transplants readily. It is possible to raise it from seed, but the stones must be separated from the pulp of the berry and it may be two or three years before germination takes place. Division of the clumps is far easier. Some years ago a yellow-fruited form, var. *chrysocarpa,* was found and now is cultivated. It is quite exciting as contrast with the normal red berries, but never will be as popular for holiday decorations.

L. W. BROWNELL

FRUIT OF THE WINTERBERRY

This is now the source of most of the red berries used for Christmas in the northern states

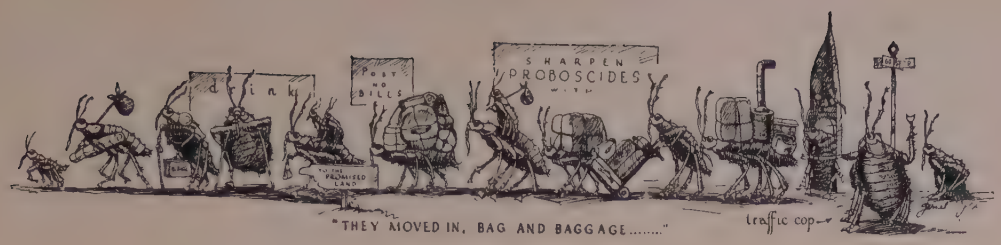
Confusingly like the common winterberry is a similar species, the smooth winterberry, *I. laevigata.* To the botanist the difference is that the leaves are more narrow and longer pointed, turning light yellow before dropping, but to the seeker of winter berries the fruits are more orange than red, on longer stems, and they have mostly dropped off before winter has begun. Both may be found at the edge of the same swamp, but the latter has the more limited range of New England to the Carolinas. It is not so useful for our admiration as the other. A yellow-fruited form, var. *herveyi,* was found near New Bedford, Mass., several years ago.

A large shrub is the possumhaw, *I. decidua,* growing quite tree-like at times to fifteen feet. Though the berries are larger, the resemblance to common winterberry is close. The twigs are gray rather than black, and the leaves are very dark green, of oblong shape and the apex blunt. Though a winter feature of moist soil from Virginia southward, it is easily grown in our northern states.

Even more tree-like is mountain winterberry, *I. monticola,* reaching twenty feet. When in fruit it outshines a large hawthorn with a heavy crop of red berries. This has the same range as the last but more in the hills and is less common in the wild and rarely cultivated. A field difference is that the leaves are very thin, smooth and long pointed. It could be grown in parks and gardens as a better substitute for mountain-ash, for, like all our deciduous hollies, it is free from pests. In its native home it is one of the several shrubs or trees with the local name of "buck-bush."

Mountain-holly, *Nemopanthus mucronata,* is of no service in our winter bouquet. Though a holly it has been removed from *Ilex* and several names have been fitted to it. Externally it is much like the winterberries, but the leaves are smaller and more finely toothed. The larger rose-red berries swing on long stems in July and August, and soon have fallen. For a time in the blueberry season the fruiting show is wonderful, but all too brief to make the plant of popular value. Its home is throughout our northern woods, and it may be easily cultivated, especially in an acid soil.

From red hollyberries we may turn to black ones, or our one native species with black fruits and evergreen leaves, the inkberry, *I. glabra.* The only similar shrub from Japan, *I. crenata,* though less hardy, is now much seen in gardens. Let us give inkberry a chance. Its one failing is slight difficulty in transplanting, for it has few fibrous roots, but once established it makes big clumps. It will thrive in any soil, from sand to clay, regardless of acid or alkaline condition. Thus it can be grown where the heath family refuses to live, and has a darker green of foliage than do most heaths. Very hardy it is, never showing brown or discolored leaves in coldest weather, but is as fresh a green at zero temperatures as in midsummer. There is much the appearance of box to its foliage, but it is not fragrant, and the leaves are arranged alternate on the twigs, toothed at the apex. On the female plant small black berries are abundant all winter. As it is wild from Nova Scotia to Louisiana Nature has done her part, and man should make its cultivation widespread. The foliage of this and the berried twigs of common winterberry should become the symbol of our winter holidays and give our vanishing American holly the opportunity to flourish again.



FRIENDLY ENEMIES

The Life and Unnatural History of a Terror by Night

by A. B. Champlain

Illustrations by Jex

SPEAKING confidentially and in a low tone we are prepared to tell the uninitiated about certain "familiar" creatures that prowl in the jungles of our flats, that invade the sanctity of our chambers, and ride with the nightmares that infest many hotels and boarding houses. Much mystery has been made of these "terrors" of the night and they are seldom mentioned in polite society, yet they are, perhaps, better known superficially than any other insect and the one most directly affecting man,—so step up folks, lay aside your prejudices and meet the bed-bug.

MR. CHAMPLAIN'S *article was submitted to the editors of three of our most widely-known publications. They all were enthusiastic about the story but returned it because they were afraid, they said, that it would offend their readers. Nature Magazine feels that this is a most worthwhile article and is confident that its readers will agree. In this day and age a spade is called a spade.*

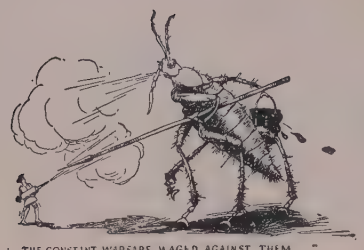
Belonging to an old established strain of domestic animals, these little visitors display a surprising amount of cunning and perseverance and have almost assumed intelligence since their associations with man. Their activities have been tabulated as far back as man has kept records and their ancestry, no doubt, existed long previous to this time. During the prehistoric age of human kind and at the time of their first acquaintance with the early human species, these bugs probably possessed wings. They were able to fly from place to place in search of food and to find shelter from the weather and against the attacks of enemies. Once having acquired the taste for human blood, at first a luxury to these flying pests, it finally became a habit, just as human flesh appeals to the man-eating tiger. Not satisfied with this, they found the home of man comfortable and to their liking. They moved in, bag and baggage, and gradually settled down to a more or less sedentary existence and became; through the evolutionary process, the blood-thirsty parasites that they are today.

"DURING THE PREHISTORIC AGE.... THESE BUGS PROBABLY POSSESSED WINGS"

With no longer a necessity for leading a rambling life like most insects, but becoming domestic animals of a sort, they have lost their wings and cannot fly. Mere rudiments confirm the supposition that wings were at one time present, their position being indicated by a pair of scale-like projections on the thorax. We may well thank Providence that this is the case, as the absence of wings is a great advantage in control work, confining the activities of these pests to a range that may easily be reached by many expedient remedies.

Adaptations to home conditions and the necessity for living in the chinks and joints of beds and other furniture, behind the wall panels and paper and in other narrow cracks and crevices, have given them a very flattened body. Being short-legged and walking with the six legs in nearly the same plane as the body, they are easily able to get into these narrow quarters. Great numbers can hide themselves in places where there seems scarcely room for more than two or three. They pack themselves so closely together that we may find hundreds of them forming thick layers of living insects. Their need for caution on account of the constant warfare waged against them by their unwilling hosts has also degraded them into night prowlers; and they only feed in the daytime when they can do so without detection or when driven by hunger.

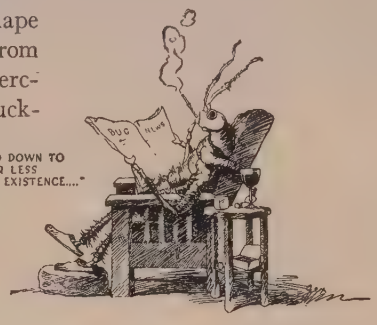
For the benefit of those persons who have never examined a bed-bug very closely we will attempt to describe a full grown and prosperous individual of the species. There may even be "those" who have never seen a specimen of this "six-legged terror." Lucky people! So don't be timid or fastidious; a bug more or less, is not a serious matter if you know how to handle it, and we will treat the matter as



"...THE CONSTANT WARFARE WAGED AGAINST THEM....."

slightly and lightly as we can.

About three-sixteenths to one-fifth of an inch long and something less than one-eighth of an inch wide, our monster in miniature has a flexible, broadly-oval flattened body. The general color is reddish-brown, varying to bright red when engorged with blood. The legs and beak are lighter. Over the whole body there is a dense covering of short bristles or hair that are not generally observed without a magnifying glass. The head is rather broad and fitted into the front margin of the thorax. At each side of the head the prominent compound eyes may easily be seen and the four joined antennae or feelers with the two basal joints thick and the terminal joints slender, complete the general description of our little beast; all except the important matter of its mouth parts. This organ is formed in the shape of a beak or proboscis, which starts from the front of the head. It is used for piercing the skin of its prey and then as a sucking tube in which the blood is drawn up into its body.



"....SETTLED DOWN TO A MORE OR LESS SEDENTARY EXISTENCE....."

Some persons are never bothered or affected by the bites of these "prowlers of the night," and they may be wholly ignorant of their presence, while others suffer little less than torture from their venomous beaks. The symptoms of their activities, in addition to the general uneasiness and sleeplessness that they cause, is the presence of inflammation or swelling on exposed portions of the body, that itch and burn. These swellings are usually in the shape of small, hard, whitish wheals, with a tiny red center where the puncture was made. These wounds should not be rubbed or scratched at any time on account of secondary infection, but relief may be found in certain substances that are recommended for this purpose. Peroxide of hydrogen and dioxygen are suggested, while an application of rubbing alcohol or a dab of tincture of iodine will quickly relieve and cure any ill effects from these bites.

There is no doubt that these insects play some part in the carrying of disease, although little is known regarding their importance in this respect. It is well to consider these possibilities, especially when travelling and stopping at indifferent hotels and boarding houses. Bed-bugs are provided with the mechanical means of spreading disease with their beaks as well as the possibilities of their being the alternate hosts of some specific organism.

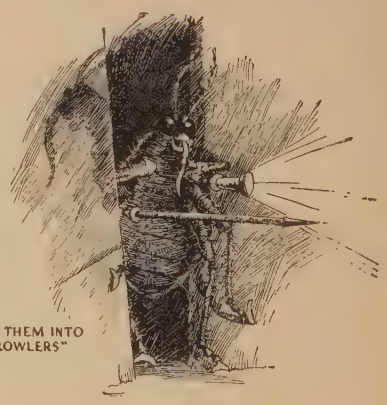
One of the most characteristic features of the adult bed-bug is the very distinct and disagreeable odor which it exhales. Our olfactory nerves are usually sufficient to determine the presence of these creatures in a room before we see them, which is a decided advantage to the traveller who wishes to discriminate. This peculiar "buggy" odor is due to an oily, volatile secretion from certain minute glands situated inside of the body of the creature and opening to the outside of this night terror.

It is no disgrace and not necessarily an indication of neglect or carelessness to find these abominable human parasites in the home, as they will migrate from one house to another. They may enter through cracks in the walls, along plumbing lines or sewers, and no house is really safe from them. The mistake is in allowing them to propagate and become too well established before attempting control. One female may be brought into the home on the clothing, in the laundry bag, on trunks and bags of travellers and in a thousand and one different ways. This single female,—single meaning one and not implying an unmarried state,— after locating herself in some convenient place, may deposit at least fifty eggs and probably one hundred or more and so found a large colony before its presence is detected. Records show that one female has laid as many as 190 eggs.

Although there may be a great variation in the number of generations in a year, depending on temperature and food supply, we are told that there is an average of at least four generations where houses are kept warm over winter. Simple mathematics show some of the possibilities of the bed-bug population of a house after one female had been introduced.

Returning to the life story of these little monsters, we discover that the eggs or "nits" are white oval objects with a little projection or rim around one end. They are very small and can be inserted by the parent at the very bottom of the crack or crevice in which she has made her home. The eggs are laid in batches of from six to fifty and when newly laid are covered with a sort of varnish which rapidly hardens when exposed to the air and forms a cement by which they are securely fixed to the object on which they are laid. The eggs hatch in a week or ten days in warm weather but require three weeks or more during the colder months of the year. Emerging from the eggs by pushing open the little lid-like top at the projecting rim, the newly hatched bugs or nymphs, now so small as to be almost invisible, are ready for business. When they have succeeded in attacking some human being, the blood that they have taken may be seen through their transparent skins and they look like tiny moving specks of scarlet. They attain their full growth in about three months under favorable conditions during which time they have changed their skins or moulted five times. At first yellowish white in color, they gradually assume a darker shade as they progress toward the adult state.

The question of eradicating these insects from buildings is an important one. It is a matter of health, sanitation, and general comfort to



"....DEGRADED THEM INTO NIGHT PROWLERS"

all concerned and should not be treated lightly as a necessary evil or allowed to persist on account of any false modesty or ignorance. Call for help if you cannot cope with the situation yourself. Many states and the U. S. Government issue bulletins and recommendations that are effective, and there are successful insecticides on the market. Many cities have their civic departments that advise or supervise active control.

There are many and various methods that have been successfully tried in ridding places of these obnoxious pests. Simple means such as taking the beds and furniture apart and painting or soaking them with high test gasoline are more or less effective. This will kill all stages of the insect as far as the gasoline will reach—but no further. When these creatures have taken up their abode in the dark recesses of the wall panels and in deep cracks they cannot be touched, by this method. It must be remembered that gasoline is explosive.

If the cracks in the walls or joints of furniture and such suspected places are painted with corrosive sublimate dissolved in alcohol, we have an excellent and lasting remedy. It is exceedingly poisonous and must be used with this fact in mind. The fumes from this substance may be dangerous, even when present in small quantities, especially in a closed bedroom.

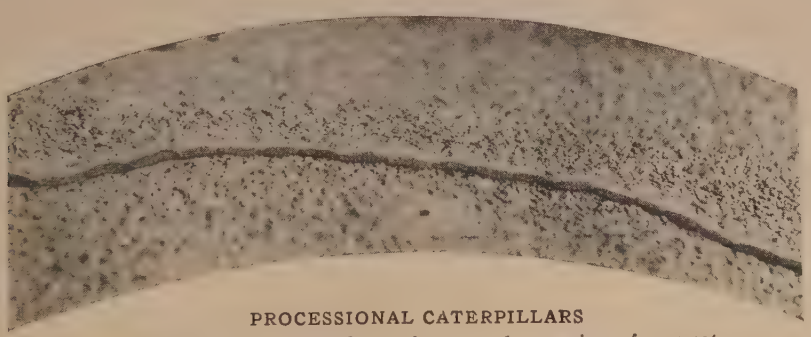
It is thus evident that in many cases the insects can only be reached by such substances as gases or vapors that will penetrate to the most inaccessible recesses of a room. Heat is considered as a satisfactory means of exterminating the bugs, when practicable. Temperatures ranging from 125 to 130 degrees F. are required to do this work and must be maintained for eight or ten hours to insure penetration to all parts of the room. This will kill all stages of the insect. We are assuming in this case that the house is equipped with furnaces or stoves. There is no doubt that somebody will have a warm job in attending the fires as this work should be done during the warmer seasons of the year.

Burning powdered sulphur or brimstone as a fumigant has been used with considerable success. Three pounds of the sulphur for each thousand cubic feet of space are required. Precaution should be taken to avoid fire as the material may boil over. Place the receptacle containing the sulphur in a large container with earth or sand and place them in the center of the room. Close the room tightly for a day or at least twelve hours for best results. There is some danger of bleaching and tarnishing certain household effects by this method. A coating of vaseline before fumigating will help to protect and prevent this in the case of metallic substances. Water or moisture in the room will add to the danger of bleaching wall papers, fabrics and similar articles and that is why earth or sand is recommended for the second caution.

The most effective fumigant of all is the deadly hydrocyanic acid gas. It is very poisonous to man or all animals and should not be used except by persons thoroughly familiar with its dangerous nature—and who also are perfectly familiar with methods of use.

In Union Strength

by E. H. Mears



PROCESSIONAL CATERPILLARS

In the center foreground can be seen the opening of a meat ants' nest

WHETHER from instinct or other cause, many of our insects display remarkable faculties that in a human would be called wise reasoning. The processional caterpillars found in the Kumbia District, Queensland, Australia, are an instance.

In the illustration above is shown what appears to be a rope lying across the sand. It is, in truth, a parade of caterpillars, travelling end to end in a line. The writer photographed this procession, which, in its entirety, was about twenty yards long and must have contained 350 to 400 paraders.

One of the most interesting things about the processional caterpillars is that when in parade assembled they seem free from attack by other insects. In this case they were crossing the site of a nest of meat ants, dauntless fighters. The ants stayed discreetly underground until the writer stirred them up. When they then came out they rushed frantically about without attempting to attack their hairy visitors, and the majority soon returned underground.

One caterpillar, however, got out of line and two ants immediately attacked it. There was a fierce fight for several minutes, from which the caterpillar escaped but only after being considerably wounded. It seems to prove that in union there is strength, a principle that was put into effect by many insects long before man defined it.

A PAIR OF BLUE-EYED SIBERIANS

These snow-white fellows were two of the author's dogs who were faithful servants

SUPER-DOG OF THE NORTH

By Frank Dufresne

of the U. S. Biological Survey

Along in the year 1908, when the famous 408 miles All-Alaska Sweepstake race was enjoying its greatest popularity, and the staghounds, bird dogs, and various cross-bred types were battling for supremacy, the steamer "Corwin" shoved her way through the ice-fields from East Cape, Siberia, into the Nome roadstead and unloaded a hundred or more sprightly little plume-tailed dogs. Their owner, Goosak, a Cossack fur buyer, announced with conviction that these short-legged, roly-poly pigmies were going to make our long-limbed hounds and fleet-footed setters look both "seeck and crippled" in the next big race.

They came near doing it, too. They beat our best dogs so often and so decisively that we decided the only way to compete against them was to send over to Siberia and get more just like them. To abbreviate, we have been importing them ever since, until today these gay little immigrants rule the wind-blown trails of northwestern Alaska.

From the Kamchatkan Peninsula and the boreal Lena River in bleak, barren Siberia came these wonderful dogs. In a country of magnificent distances where near neighbors are a hundred miles away across the treeless, trackless tundra they developed to their present-day miraculous power of endurance. It is said that any dog failing to run a hundred miles at a good fast clip is summarily shot by its Russian master. Yet the Russians love their dogs and value them highly. An ordinary dog on the Siberian side will cost five white-fox skins or about $150; good lead dogs often bring ten or more white-fox skins.

No amount of cold fazes them. In Siberia their harness goes on in the fall and does not come off until spring. At the end of the ten, twelve, or sixteen hours of a day's travel the sled is anchored, the tow line stretched taut, and the dogs are left to sleep in the open for the night. If the owner has a pound or two of seal

LOMEN BROTHERS

SEPPALA AND A CHAMPION TEAM

The noted dog racer and his Siberians who won the All-Alaska Sweepstakes three years in succession

meat to toss each dog, all well and good, but if this is not forthcoming they lose no time fretting or whining but curl themselves into tight, fuzzy balls and go soundly to sleep until times are better. There are many instances of dogs traveling three or four days without food without appreciable loss of vigor. Siberia is a lean, hungry country and it has developed a dog with more stamina than any other domesticated beast.

An outstanding trait in the Siberian dog is its sunny, genial disposition. There is none of the fierce fighting and throat slashing so common to the native Alaskan dog. Instead they dwell amiably together and have genuine affection for one another. With man they are slow to make friends, but once having been won over they serve with a cheerful loyalty that cannot be surpassed. They are what is known as "one man dogs."

"SOLLIE", A GREAT LEADER
A Siberian dog noted for his skill and endurance with the sled

The speed they make is remarkable; their endurance marvelous. In the 408 miles All-Alaska Sweepstakes they hold the record by covering the distance in 74 hours, 14 minutes and 22 seconds. This is not going time but is all the time elapsing between the hour the team left Nome until it returned, including all the time the driver and dogs rested at the roadhouses. The actual running speed for the distance is more than ten miles an hour. In the shorter races they travel like an express train and have averaged better than eighteen miles an hour in some of the races around Nome. Contrast this with the five or six-mile speed of the ordinary trail dog.

Occasionally among these dogs is found one with blue, or "glass", eyes, colored like the summer sky. Dog men look with favor upon this peculiarity and it does seem that these blue-eyed dogs nearly always possess special vigor and intelligence. The dogs themselves come in a mixture of blacks, grays, and whites but with never a taint of red, brown, or yellow.

On the Alaskan trails on the winter days, I have used about every type and breed of sled dog and have encountered the usual amount of cold weather, blizzards, and wind storms that fall to the lot of every dog musher. I have traveled for miles in timbered interior where every foot of the way had to be won through waist-deep snow, light as down, and have skirted the Arctic Coast line, where the crusted snow is packed in sharp windrows, hard as ice. Pound for pound my Siberians were always the better dogs.

It is true, however, that the Siberian dog is preeminently at its best on the hard, wind-packed trails of the coast sections. They can scamper for miles, it seems, without showing the least sign of weariness. The regular thirty-mile run from roadhouse to roadhouse is nothing for them when trails are good. If time presses the Siberians will carry you to the second—or to the third roadhouse in a day. Give them an eight or ten-hour rest and they are ready and eager to go again.

The Siberians have a peculiar, bounding lope that carries them over the ground like a low-flying bird. Their feet seem scarcely to touch the ground. There is no jolting or jarring of the body as in the heavier dogs. The years of careful breeding in a land where their endurance is continually being tested to the limit has evolved them into perfect running machines.

One of the secrets of their swift gait is the abnormal length of the humerus bone. Racing men claim that this long upper arm gives them the powerful, straight ahead, trail-covering reach. I have noticed that no dog, however perfect in other ways, ever finds its way into a Siberian race team unless it has this long stretch from shoulder to elbow.

The short, blocky body of these dogs makes for pull-power and endurance. Dogs of the greyhound or allied species may travel very fast but they do not carry the weight in their loins so necessary in a draft animal. Offhand I can recall a dozen other varieties of dogs that might travel a hundred yards fast-

A COMPETITION IN PUPS
The little fair-haired child enters her Siberian pup for honors against the native tot's malemute

er than a Siberian dog unhampered by any burden, but harness these same dogs to a sled and they would scarcely be dragging out a weary fifty miles when the Siberians breezed jauntily past the hundred-mile mark.

Dogs are neither playthings nor pets in the Northland. They are partners. Without their cooperation northern Alaska would exist only as a number of widely scattered hermitages. When winter closes down upon us in November and holds us fast in its chilly grip until the next June the dogs are our connecting links from cabin to village and from village to city. The long stretches from thirty to fifty miles between stations are too much to attempt on snowshoes or skis. The reindeer, though valuable as a food product, has not yet demonstrated its value as a driving animal. It is to the dogs that we turn and the faster they go the less we are exposed to the often unfriendly elements.

When the weather is fair, travel on the trail holds a zestful charm even in midwinter but storms have a way of picking up from nowhere at all in almost no time at all. These frigid gales carry death in their teeth for both man and beast. The sooner sheltered the better.

One winter day I left the shelter cabin at bleak Cape Douglas in company with another team and drove twenty-four miles across the open tundra and sea ice to Teller. It was cold—forty-two below, as I recall it—a strong north wind blew directly in our faces all the way over and made the experience anything but pleasant. I urged my dogs to make speed and they responded by battling their way into the wind across that twenty-four miles in less than three hours. Other than a minor frostbite or two I suffered not at all. The other team, however, composed of the old fashioned malemutes more or less crossbred with "outside" dogs required six hours for the same journey. In the last hour four of his dogs froze to death and the driver himself was seriously frostbitten. Had the trip been ten miles longer the Northland would have claimed another victim. This incident shows the extreme value of time and the urge for faster dogs.

The Siberian dog comes to us from across the Bering Sea like a gift from the gods. He comes to us an efficient, case-hardened, highly polished master of the winter trails. He is the toughest, sunniest, "peppiest" little stout-hearted super-dog that I have ever known.

A Nature Puzzle

By Florence H. Moore

THE object of this Puzzle belongs to the great family of birds. Although he cannot fly, my, how he can kick. He is a swift runner, too, often making sixty miles an hour and he has traveled far over the hot sands, to reach this oasis in the desert. (Do you know what an oasis is?) He is strong enough to carry a man or woman on his back and often grows to a height of six and eight feet. In certain localities, especially out in some of the western states, he used to be raised for commercial purposes. Like Old Mother Goose, however, he is none the worse for being "plucked," and straightway proceeds to raise another crop.

You will also find the letters of his name in the picture. Write them down as you find them, then assemble in order to spell his name.

Answer to November Puzzle
MALLARD DUCK

ARTHUR A. SHURTLEFF, LANDSCAPE ARCHITECT

JUST APPLE TREES AND STONE WALL

A simple but particularly effective arrangement making a beautiful natural picture

LANDSCAPE *and the* HOME

by Bradford Williams

Member, American Society of Landscape Architects

GARDENING from necessity is as old as the time when man first discovered that hunting and fishing were not his only means of sustenance. The cultivation of ground has always come in primitive tribes with the earliest years of civilization. The explorer in the uncharted valley of the Amazon knows that the hut in a clearing with a piece of tilled land above the river bank is the dwelling of a native more civilized than the fisherman whose cruder shelter is concealed among the uncut trees at the river's edge.

Pleasure gardens—that is, gardens which by their appearance are pleasurable—are mentioned in the old classics as having existed in very early days, but these were undoubtedly no more than neatly arranged vegetable gardens. From all we can discover, the garden created primarily for pleasure appeared only when civilization was well advanced and some degree of peaceful living assured; and thence it advanced until in the Nineteenth Century we find a perfection in the art of gardening which marks the beginning of the profession of landscape architecture.

There is everywhere to-day an increasing interest in growing things for their appearance. Nature in some form is being brought home to the dooryard. As we motor through the countryside we see an improvement in the appearance of the home grounds which was hardly predictable twenty years ago. In the suburbs the small garden has become an adjunct of nearly every home, and in the city the urban dweller has begun to conceal his paper barrels behind shrubbery screens and to convert his clothes posts into trellises for the support of ornamental vines.

In literature as well as in our daily surroundings we find this increasing interest in horticulture. New books on gardening with alluring titles entice the enthusiast to new experiments; new horticultural magazines for the purpose of discussing these experiments have sprung up in different sections of the country. Horticultural societies have increased their membership, and new garden clubs have been formed for the discussion of subjects associated with horticulture.

But gardening as the science of growing plants for the perfection of individual specimens is being accompanied by a new and increasing interest in their effective arrangement in the landscape. A tree, shrub, or flower is no longer studied solely for its merit as a sample of some particular species or variety, but rather as an element in the composition of a picture. This interest in design is readily discernible in the contents of magazines devoted to home and garden, in the subjects of lectures before horticultural societies, and in the programs of garden clubs. A gratifying result of this new interest in design has been the formation and exchange of ideas rather than a mere acquisition of facts, and this has led to an improved use and appearance of home surroundings and the beginning of a widespread appreciation of the landscape, and the possibilities that it offers.

THE author of this article is Executive Secretary of the American Society of Landscape Architects, and a member of the Editorial Board of "Landscape Architecture".

Landscape is Nature's appearance of land, water, and sky either under natural conditions or as affected by man. Appreciation of landscape as we know it to-day is found in the writings of the great Romans and may have existed even earlier in Greece. The Grecian mind, however, saw landscape only as the personification of some god or goddess, and true appreciation of the earth's beauties was therefore obscured in the mist of mythology. It is said that the Greek classics contain only a single reference to Lycabetus,—the most interesting and beautiful hill on the Attic plain, and double the height of the Acropolis,—which could hardly have escaped frequent mention in the literature of later centuries.

The early Christian era, partly because of pagan association of Nature with the gods and partly because of the total negation of all beauty in the physical world, banished Nature as a subject of interest. The great movement of the Renaissance, however, revived this interest, and in the paintings of the sixteenth century we find landscapes used as the background for the more serious representation of man usually as a churchly figure. As painting developed under the changing influence of the Renaissance, the characterization of man became of secondary importance to the representation of landscape, and in the next century we find man in the great landscape paintings of Rubens and Claude only as a detail in the whole great Nature setting.

H. ARMSTRONG ROBERTS

A GARDEN ATTRACTIVELY SET

Red cedars, fortunately grouped, serve as a background for the main garden walk

The deliberate creation of gardens modelled after the landscape appears to have begun in England in the Eighteenth Century. The appreciation of native scenery which appears in the poetry of Thomson, Gray, and Cowper also found expression in the skillful style of Humphrey Repton, whose suggestions for estate development did much to develop the gardening taste of the age.

What Repton did for England, Andrew Jackson Downing did for America in the early Nineteenth Century. Each stated in book form what he considered to be the principles of landscape gardening, or landscape architecture as we now prefer to call it; and these principles have been the basis on which the

A GARDEN ARRANGEMENT FOR A COUNTRY HOUSE

A stately elm, iris fringed pool and gently sloping meadow often are suited to such treatment

OLMSTED BROTHERS, LANDSCAPE ARCHITECTS

PAUL FROST, LANDSCAPE ARCHITECT

A BACKYARD GARDEN WITHIN THE CITY

Privacy is the essential in such cases and it is well attained here

modern profession of landscape architecture has been built.

Just as the first appreciation of landscape as applied to the home was taught by men who discovered it for themselves through study and observation, so the new modern interest in landscape is spreading among those who *observe* that which they *see*. The development of the automobile and its gift of easy access to countryside which has hitherto been attainable only by few, has created a new opportunity for enjoyment of landscape. Improvement in the facilities and reduction of the cost of steamship travel are means of making accessible the natural beauties of the old world as well as the landscape of less familiar countries. And for those who are not able to travel either at home or abroad, there are books and articles dealing with the new interest in gardening, from all of which something may be learned.

The landscape architect, a specialist in landscape, is one who has been trained in and who practices the art of arranging land and the objects upon it for human use, convenience, and enjoyment. Landscape, therefore, which we have defined as the *appearance* of land and the objects upon it, is of supreme interest in all the activities of the landscape architect, whether in public, semi-public, or private work. But particularly in the home grounds must he be guided by it, since man's dwelling, under ordinary conditions, has always been foreign to the natural aspect of the earth. To possess that attractiveness which we want in the appearance of our homes, we try to conceal as far as possible the artificiality of our buildings by designing them in a style suggested by the landscape.

If the forms of service which the landscape architect is able to render in developing a home were to be examined, we should indeed find the regard for landscape a controlling factor in each.

The selection of a location for the home is a decision of far-reaching influence in the life of every citizen. As an investment in happiness as well as some of the more concrete aims of life, homebuilding deserves the most intelligent study and careful thinking we are able

A BLEND OF HOME AND LANDSCAPE

The rounded boxwood, the "ivy green" and the mellow sunshine make the house an intimate part of the landscape

H. ARMSTRONG ROBERTS

to give to it. And yet there are few problems which the average citizen is less adequately equipped to solve. Knowledge of what constitutes a good home site is rare indeed, and the irresponsibility with which our citizens acquire property in which to bring up the next generation is discouraging.

As individual tastes vary, so do opinions differ as to the essentials of a good home location, but those who have thought about the subject will probably agree on the following five qualifications: the location must be convenient, pleasing to the eye, and quiet to the ear; and, more abstractly, it must be economically and socially attractive. Advice is frequently sought to weigh the advantages of one neighborhood against another, and the experience of the landscape architect in many such cases enables him to estimate the good and bad points of each, and to reach a decision which is of great assistance to the homebuilder.

H. ARMSTRONG ROBERTS

SCREENING THE SMALL HOUSE

This carefully planned arrangement of trees and shrubs screens from the street

When the general location and particular parcel of ground have been selected, the landscape architect is again asked to study the appearance of the land and to advise as to its various uses, which include the actual site of the house. Two points enter into these considerations: the tastes and desires of the owner, and the character of the existing landscape and of that to be created. Since the type of house to be built together with its surroundings depends both on such of the owner's tastes as his love of the simple, the ornate, the naturalistic, or the formal, and on the kind of landscape which already exists, the landscape architect proceeds to study the natural conditions with a view to adapting them to some form and use which will express the personality of his client. These natural conditions include the physical attributes of the land, such as topography, trees, and water, as well as those characteristics which result from them, such as view, exposure to sun, and protection from wind.

When he has decided how the view lies best, what trees must be kept, and where the formation of the land suggests a location for driveway and other utilitarian features, he is ready to express a general opinion as to where the house shall be placed, what its general character of appearance shall be, and how its rooms shall face. At this point, with no further suggestions to be derived from the landscape, the house architect is invited to confer on the report of the landscape architect with its suggestions for the general character and arrangement of the house, and to work out the details of building design and construction. Both architect and landscape architect, working for the benefit of their client, thus coöperate in bringing to the solution of a common problem the knowledge of their respective professions.

The landscape, having determined to a considerable degree the type of development of house and grounds, now becomes the medium through which the development takes place. Each area in our preliminary plan has been given a use or purpose for its being; the problem now is to impress each area with its character—that is, to make the garden area become a garden, etc. This impression of character is achieved either through construction or planting, but usually through both.

Landscape construction is the alteration of topography and the addition or removal of objects in the landscape for the purpose of obtaining a desired effect. By the skillful arrangement of different levels, we are able to introduce terraces, steps, and naturalistic slopes, and thus establish in each a definite character which results from use.

BREMER W. POND, LANDSCAPE ARCHITECT

A VALUABLE ADDED TOUCH TO THE GARDEN

A few steps, where possible, to connect the lawn and garden provide an interesting touch

Landscape planting is the arrangement of growing things in such fashion as to enhance the landscape through their visual appearance. The purpose of this liv-

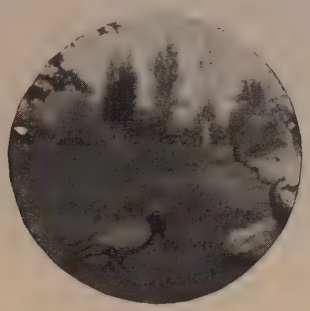
ing material may be one of ornamentation in itself or as a means of improving the effect of other portions of the landscape by screening unsightly objects, defining boundaries, etc. Whether used in mass form, as individual specimen, or as architectural form,—such as the neatly trimmed hedge,—we have the problem of either heightening the already existing naturalistic character of the landscape or of transforming it into an adaptation of some style that is not naturalistic.

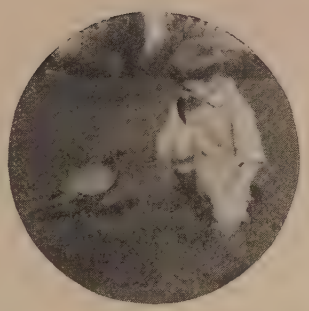
But since the landscape is largely composed of living things, the appearance of the home grounds is ever changing because of the process of natural growth. An effect which is planned in the beginning may not be realized for some years, and when once achieved, may be lost by undergrowth due to neglect of maintenance. Clear understanding of the design and watchful care from year to year are needed to create and keep results.

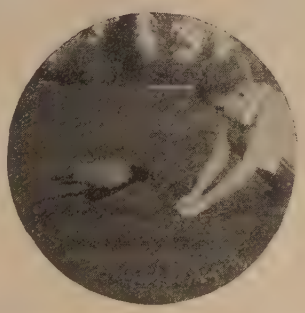
The purpose of this article has been to show how man in the process of homebuilding is dominated by the influence of landscape. This influence, if understood and rightly interpreted, is the foundation on which all good landscape design is based; when disregarded, it nullifies all attempts at successful design. These are very general observations which have the advantage of being applicable to all such problems, even though the difficulty of giving advice in the matter of design without knowing the circumstances peculiar to each individual problem makes any discussion such as this seem highly theoretical.

If gardening for pleasure is to attain the perfection toward which modern enthusiasm is urging it, we must first become thoroughly conversant with the principles of landscape design, and then practice them according to dictates of the fine art of landscape architecture.

A Wild Friend







This is the story of a crow who braved the frigid winter of the mountains near where Rip Van Winkle was wont to awaken the echoes with his bowling. It is a story of a crow befriended by man and, in turn, man's friend and companion.

There was commotion in the field, for there was an argument in crow circles. A young fellow was being ruthlessly pecked by his confreres, for what reason the crows only knew. John West arrived in time and rescued the youngster, nearly dead, carried him to his barn and fed and nursed him back to health. He christened him Jack and he became a fully accredited member of the family.

Jack became a home-loving crow, wandering about the house and repaying the hospitality with a never-failing originality of tricks. He liked motoring, travelling perched on the roof of the car, and in payment for his rides declared war on marauding crows and drove them from Mr. West's corn. He developed a bad habit of carefully picking the clothespins from a line of newly-washed clothes, carrying this activity to a neighbor's yard. The neighbor failed to see the joke and ultimatums were exchanged, the neighbor threatening to shoot Jack and Mr. West promising to shoot the neighbor if he did.

On one of his friendly tours Jack called on us, surprising us by flying down on the lawn and walking up to inspect us. He made friends with Coplin, our small boy. They played at the business of hiding mountain ash berries, Coplin gathering them, Jack filling his bill and burying them at the root of a maple tree. He explored the place, outwitting the cat and scolding it from a safe perch on the barn roof.

Jack was a frequent visitor, coming to see us in the fields and even going on a trout-fishing jaunt. But we miss his visits now, for his end came, whether from one too many clothespins we do not know.

THE CARLSBAD

by Hugh Stevens Bell

A BIT OF THE KING'S PALACE

The author, standing in the center beneath the beautiful arch gives an idea of the size

THRICE I have toiled my photographic way through the arteries of the earth,—at Shoshone Caverns, Wyoming, at Oregon Caves, Oregon, and at Carlsbad Cave, New Mexico. Arteries these, beautiful arteries, carrying in their inky darkness the lure which gives new life to the explorer of caves. But the magnificence of Carlsbad so dwarfs the beauty of the others that they are soon forgotten. All their show places would pass unseen in any of Carlsbad's greater rooms.

We found ourselves in the thriving little town of Carlsbad, away down in southeastern New Mexico, one glorious night late in September. We were there for a guide and some milk. My particular portion of milk was presented in a glass which had, since last visiting the dishpan, been the happy home of some Mexican red peppers. My doctor has often advised hot milk. For once I carried out the suggestion, and long into the night I was painfully aware of the fact.

The New Mexican hills of the Carlsbad region have numerous caves of astounding size and marvelous beauty, but the one which has risen so rapidly to world renown is the largest of all, possibly the largest in the entire world. Armed with Dave Mitchell for a guide, we set out the next morning, soon after those red peppers had allowed my tortured mouth to cool down. Until quite recently the descent of man into Carlsbad has been accomplished in a fragrant guano bucket, but this romantic joy is also a thing of the past.

FORTY THOUSAND YEARS OLD

That is the probable age of the formation against which the guide is leaning

The enterprising Chamber of Commerce of Carlsbad has constructed an excellent stairway down a recently discovered entrance, about half a mile beyond the guano shaft. Entrance here not only saves a strain on the olfactory organs, but also allows the visitor to ride half a mile closer to the immediate wonders of Carlsbad.

The mouth of the cave is in keeping with its gigantic interior, and your guide does not have to tell you to be very careful not to bump your head. At the foot of the stairway, some two hundred feet below the mouth, one finds himself in a huge tunnel, per-

MAGNIFICENT

Photographs by the Author

IN CARLSBAD'S MARBLED HALLS

The background is a mass of marble foliage. Note the curving stalactites in the upper left corner

haps fifty feet high and almost that distance across.

As cave floors go, this one is moderately smooth, and the trail leads off to the right through the great gloomy passageway. Straight ahead from the stairway is the portion of the cave occupied by its millions of bats, but to the right they are rarely seen at all, and never in great numbers.

Strangely enough it was this lack of bats which really led to the discovery of Carlsbad, the magnificent. For about twenty years Jim White, Dave Mitchell, and others earned their daily bread by mining the evil-smelling, life-giving guano. Jim White realized that the day would eventually come when the known deposits would give out, and so he set out, a dozen years ago, to hunt for others. Down he went into the Devil's Den, toiled slowly out of it, passed the Sleeping Lion, walked beneath the Hippo's Mouth (it is perfect) and on over hill and dale—for Carlsbad is big enough to have such things—until he eventually discovered what he called the King's Palace, a series of gigantic rooms, magnificently ornamented with thousands of tons of marvelous formations. Recent explorers have renamed this group, or the largest room of it, Shinav's Wigwam.

Jim was quite interested himself, but he hardly felt justified in telling the world of his discovery. It was guano the world wanted. It was guano he was seeking. It was guano he determined to find. But he never found it, because the bats never turn to the right after entering the main mouth of Carlsbad.

TWIN DOMES OF CARLSBAD

These mammoth stalagmites are one of the wonders of the Carlsbad caverns

Slowly the deposits crept nearer to exhaustion, and the little group of miners could see the day when their work would be done. There were other difficulties too. South American nitrates, and South American guano came into the markets of the world in increasing quantities, and at ruinously low prices.

Then it happened. Someone who knew caves was shown the wonders of Jim's "King's Palace", and other chambers of rare splendor. Soon there was a scientific expedition exploring Carlsbad with Jim White leading the way to known rooms and searching for new. President Coolidge declared it a na-

AT THE ENTRANCE TO CARLSBAD CAVE

The mouth of the cavern is surrounded by the flora of the desert under which it lies

tional monument on the strength of that expedition's report, and Jim White became chief guide, with Dave Mitchell and others who had toiled with him for assistants. Stairways were built of gunnysacks filled with earth, cables were stretched to make progress a possibility for Tom, Dick and Harry in the more difficult places, daily the fame of Carlsbad grew, and others beside Jim and Dave got much of the world's praise, praise and glory which should have fallen to the lot of those humble guano miners.

There we stood at the foot of the stairway with Dave for a guide, and the trail which Jim White pioneered led off to the right. A quarter of a mile down it we came to a pool with a tumbler beside it, so we stopped to drink our fill of cold, clear water, and then decided to eat our lunch.

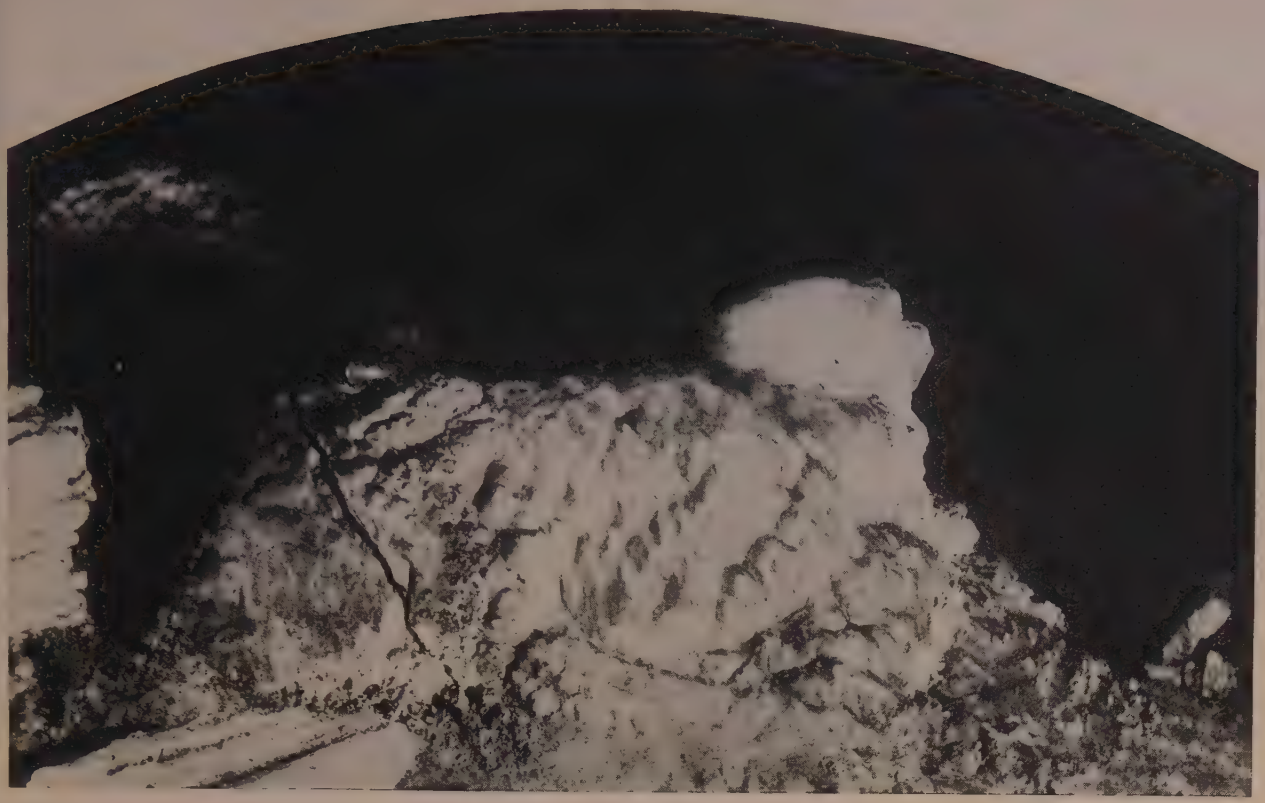
ALONG THE TRAIL IN THE CAVE

Can you find a black cat in the picture of this hall of wonders?

Sated, we went on over Jim White's trail, down two hundred feet into the Devil's Den—the only thing named for the devil in the whole cave, thank heaven—and up two hundred out of it as soon as we had reached the bottom. Breathless and perspiring we went on past the Lion and under the Hippo's Mouth, on, on, on, to the entrance of Shinav's Wigwam.

"This is the entrance of the King's Palace", Dave said. "There is some that call it the Chinese Wigwam, but I don't know why". To be sure Shinav's and Chinese do sound alike, and to one who does not read or write or know such obscure Indian gods as Shinav, one word is just as good as the other. Besides Dave doesn't see anything wrong with the name Jim White, his idol and chief, gave to it long years ago.

I must confess that as I stood there under the magnificently ornamented dome of that roughly cir-



cular chamber, gazed upward at its great chandeliering stalactites, marveled at its richly frescoed walls, gloried in a perfect Gothic arch which leads to a small side chamber, doubted that its hangings could be marble —cave marble—and yet realized that every bit of that huge room, walls, ceiling, and floor, was marble and nothing else, it seemed to me that I was in far more of a palace than a wigwam. Like Dave, I could say of Jim's name, "I don't see nothin' wrong with it."

After we had explored the various rooms of the Palace, Dave took us through a "wriggle hole" into another large chamber which was christened Koo Vanyu's Retreat by recent explorers, to show us a particularly fine group of flowstone curtains which are wonderfully musical when tapped with a stick, and one of which seems perpetually ruffled by a breeze. Koo Vanyu, by the way, was a mythological serpent of the Indians.

DETAIL OF THE TWIN DOMES

To suggest a multitude of conventionalized elephant heads

THE LION OF CARLSBAD CAVE

The crack that shows is an evidence of movement in the floor of the cave

Carlsbad abounds in magnificent draperies of marble, many of which hang in graceful folds like great curtains of velvet. Hour after hour Dave led us on, and scarcely a minute failed to reveal something new and beautiful. In my experience most caves have a few interesting spots, and a great deal of more or less dirty passageway which is entirely devoid of interest. But Carlsbad is the exact opposite. Most of the cave is clean beyond all dreams, and even the smallest passages are crammed with interest.

"We're in the Big Room", Dave informed us hours after we had entered the cave, and had been led from one huge chamber to another.

"The Big Room !!!", I blurted. "Big! Heavens they've all been big! ! !"

"Naw. Them was just little ones. This room is

half a mile long, over 600 feet wide in the widest place, and—take a look at the ceilin'."

I turned my lantern up but its 200 candle power light failed to reveal any ceiling. Dave turned his up at my request, and then the third lantern was turned up, but their combined light was of no avail. A recent expedition had lights which allowed its men to measure 350 feet upward, but those lights failed to reach the ceiling.

This Big Room alone contains enough remarkable formations to make the cave known the world over. A group of thirteen stalagmites, at least one of which rises approximately forty feet, have been happily named the Totem Poles. One exquisite set of curtains is known as the Temple of the Sun, and another group, fully as beautiful, seem to be unnamed, because they happen to be located beside the Twin and Giant Domes, the latter of which is actually a column, for it has touched the ceiling which happens to be fairly low at this place. These so-called domes are really gigantic stalagmites set on a marble hill about forty feet high, above which they rise another forty feet at least. At their bases they must be fully twenty-five feet through. They are remarkably decorated with highly conventionalized elephant heads.

"See that hole over there?" Dave asks, as he points at some black spot in the wall.

"Yes. What of it?"

"Well, Jim White was gone down there twelve hours, and he never got to the end of it." He gives that remark ten minutes to soak in, while he leads on, chewing his tobacco in silence. Then suddenly, "See that hole over there?" and when you admit that you do, "Well, Jim White started down there one day and he didn't get back for fifteen hours, and he never got to the end of it". Again you proceed, making mental calculations of the number of miles Jim White could walk in fifteen hours, and, having seen Jim, you are certain that it is more than twenty—ten there and ten back with something to spare, "and he didn't get to the end of it."

Again you stumble ahead, perhaps to the breath-taking draperies of the Dome Room, or the dazzling whiteness of the Ice Room, and then you are aware that Dave has cheeked his tobacco in preparation for another remark. "See that hole over there?"

"Yes. And Jim White walked through it and kept right on going for umphumph hours and umpty minutes", I remark facetiously.

"Naw, there ain't nobody ever looked in it, and there's hundreds of others in the same boat." Then it is that a little cold shiver runs along your spine. You begin to realize the awfulness, the vastness of Carlsbad's marbled halls, and perhaps you wonder what would happen to you if Dave should slip through a hole like the one he showed you in the floor a while ago where "you could keep right on goin' for ninety feet, and there ain't nothin' soft to land on neither."

Perhaps I have unduly emphasized the bigness of Carlsbad and its formations, thus leading one to believe that it has nothing small or delicate, that everything about it is massive. This is far from the truth. Many rooms there are which contain hundreds of stalactites which could be cut into suitable lengths and sold for macaroni, rooms with walls frosted with fragile stone foliage, rooms iridescent with minute crystals, rooms in which one almost hesitates to breathe for fear of destroying the beauty that is there. In one passageway the floor is full of tiny shallow cups in which one may find minute limey spheres known as cave pearls.

I had the idea that stalactites always look very much like icicles—big at the top, tapering to a point, and always perfectly straight because there is no wind in the cave to make them curve like outdoor icicles. But Carlsbad's stalactites may be curved like an elephant's tusks, may be small at the top and large at the bottom, may be as warty as a summer squash, or as smooth as a candle, or may even be spiked and knotted like war clubs.

Carlsbad is not yet strung with electric lights, nor all cluttered up with antique jokes which have been handed down from guide to guide unto the tenth or twelfth generation, nor do the guides have memorized speeches which are sung at you in true third grade style.

But one of Carlsbad's greatest marvels has little to do with its marble wonders which, according to one young nurse who visited them, look like tonsils and adenoids. Fortunately this wonder is reserved for a fitting climax at the end.

We were toiling back to the Devil's Den when Dave stopped suddenly and stood listening intently. "Hear that?" he asked.

I listened, but all I could hear was the distant roar of a great wind. "Bad storm outside?" I questioned.

"Bats", was Dave's laconic reply.

"But Dave", I objected, "we're not back to the Devil's Den yet. We must be nearly a mile from the entrance!"

"We are. Them's bats just the same."

"I thought you said they never came down this way."

"They don't. Nothin' down here but mice like you saw in the King's Palace. Funny they ain't blind like them fish in your eastern caves. But that noise is bats flyin' out the mouth of this cave," said Dave with finality.

During the rest of our upward and outward journey the roar of wings did not noticeably increase. When, at last, we reached the foot of the stairway we looked up at a ceiling of black velvet which moved mysteriously, almost imperceptibly. As we looked out of the wide mouth of the cave it seemed fairly choked with fluttering shadows.

Slowly we worked our weary way up the long flight of stairs, and soon found ourselves in the midst of that mass of bats. Twice I was brushed lightly by a wing, but only twice and thousands of bats left that cave as we climbed slowly through them.

For nearly half an hour we stood there watching those bats come out like smoke from a huge chimney in a column fifty feet wide, and seemingly twenty-five feet thick, moving at a speed of at least twenty miles an hour.

"There's folks that's laughed at me when I told 'em there was millions of bats in there", Dave said after a long silence, "but at this time of the year it takes 'em a good four hours comin' like that to get out, and in the mornin' it takes four hours to get back in. I've seen 'em still goin' in after daylight many a time."

Carlsbad with its marvelous marbles is worthy of a journey around the world, but so is Carlsbad with its bats. Best of all, it is yours, for a beneficent government has set it aside for you, and your children, and your children's children, and theirs, and theirs, and theirs.

L. K. COUCH

BEAVER

Soon after capture a beaver usually becomes tame enough to be handled

OUR DISAPPEARING FUR BEARERS

by Edward A. Preble

of the U. S. Biological Survey

A GENERATION ago the bird lovers of America awaked to the danger that confronted many of our most attractive species. Preyed upon by commercial interests, that used for the furtherance of their purpose men lacking in sympathy for wild life, our herons, terns, grebes, ducks, and many other species were being slaughtered without restraint, often under conditions of revolting brutality, for the millinery trade. It was a profitable business for it involved merely the reaping of a crop sowed and cultivated by nature, the utilization of which was fostered by vanity, a human failing among the easiest of all to flatter. But the destruction was stayed. The better natures of our people were appealed to and gradually an enlightened public sentiment was kindled, and State and Federal legislation was brought forth, that gave relief to the harassed birds. The heronries are slowly recovering, the tern colonies are recuperating, our grebes are no longer shot for their breast feathers, and the general condition of our bird life, other than certain species pursued as game, is favorable. In these days the sight of a woman wearing the remains of a native bird is as notable as was the lack of such an ornament twenty-five years ago.

Today a destructive situation closely approximating the condition I have briefly described faces some other groups of our animals, and none more than our so-called fur-bearers. I use the modifying word advisably. Formerly the term was rather closely restricted, but lately with the growing scarcity of the animals usually so designated it has been extended to cover many others. The animals of cold countries once furnished most of the fur; the northern half of North America was called the "Fur Countries." Now the lands of temperate and even tropical climes, and the remote islands of the sea, are being stripped of their mammal fauna. In his mad search for profit-yielding decoration man does not spare even his closest relatives among the mammalia.

This wearing of the tanned skins of our wild animals has given rise to a demand whose effect on wild life surpasses in its destructiveness any agency that has ever been fostered by man, savage or civilized. It had its origin in the cave of the ape-man and was born of his need for some protection from the elements more effective than the scant hairy coat that Nature had given him. In some measure fur was a by-product of the animals he used as food, or of those that he was forced to kill lest they devour him and his helpless young. To primitive man the use of fur was proper and necessary, and to this day some of the inhabitants of

W. L. FINLEY

THE BADGER OF THE WEST

An interesting and picturesque animal who spends his life in destroying man's enemies

GRAY FOX—*Urocyon cinereoargenteus*

RED FOX—*Vulpes fulva*

ARCTIC FOX—*Alopex innuitus*

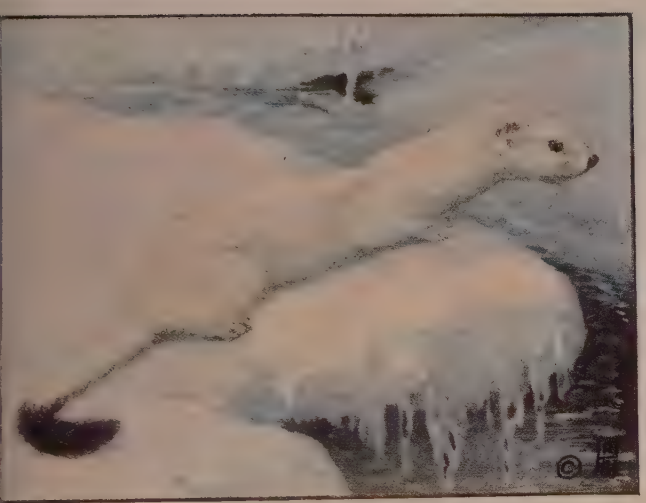
LITTLE SPOTTED SKUNK—*Spilogale putorius*

KIT FOX—*Vulpes velox*

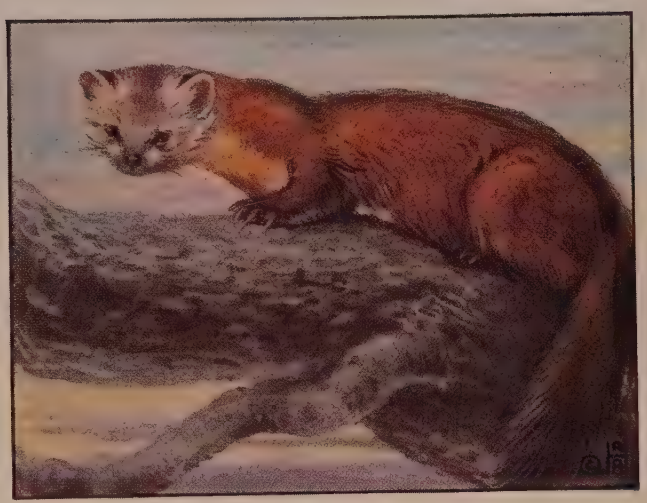
RING-TAILED CAT—*Bassariscus astutus*

Sea Otter—*Latax lutris*

Otter—*Lutra canadensis*



Arctic Weasel—*Mustela arctica*



American Marten—*Martes americana*

Wolverene—*Gulo luscus*

Fisher—*Martes pennanti*

the Arctic must clothe themselves largely in this natural product.

But time changes all things, and as man developed his mind he learned arts that enabled him to clothe himself without sole dependence upon other animals. Later his wealth grew and the desire for other than the mere necessities of life seized him. In his ceremonial and civil life he sought for symbols that would mark him from his fellows, and the latent urge to ornament his person found expression in many ways; in tattooing and other mutilations of the skin, in elaborate dressing of the hair, in ornamenting his clothing with feathers and fur. And it is largely the love for ornament that is responsible for the fur-wearing of today, for the growth of the arts has developed clothing that rivals fur in warmth and comfort and is even preferred by many tribes that from poverty and isolation formerly could procure nothing to clothe their nakedness but the skins of beasts. More than nine-tenths of the fur now worn is not needed for protection from the elements, and much of it even intensifies the discomforts of adverse temperatures, for it is worn in Summer.

LEW SMITH

SOME HALF-GROWN MINKS

Young minks at play are as interesting as other babies

A few hundred years ago the more beautiful furs found their principal markets in the palaces of royalty and the halls of high officials. The reward that came from rich peltries was the lure that led to the discovery of the remote islands of the North Pacific, to the planting of the first outposts in the sub-arctic wilds of Hudson Bay, to the exploration of the Yellowstone and the Oregon. As the uttermost parts of the earth yielded up their treasures fur-wearing ceased to be the sole privilege of royalty and others of high estate, and lately, under the skilful guidance of those who profit by its handling, the use of fur has spread to practically all classes. But since all may not wear the costly rarer furs which have been almost exterminated by unrelenting pursuit, many humbler wild creatures whose skins were formerly safe from the trapper have been gradually added to the list of victims. Coincident with the decrease of our wild animals, the demand for fur has increased.

So far we have dealt only with the skins themselves with scant reference to the species that furnish the different furs, and none at all to the individual animals—wild creatures that love their lives, their homes, their mates, and their young. To furnish these skins that are bartered so eagerly and worn so jauntily each animal must give up its life, often in agony. Should not all who love animals give thought to this? If it does not touch your heart, then our centuries of civilization have well-nigh been in vain, and the example of the Great Teacher, who ever taught charity and kindness, has passed unheeded.

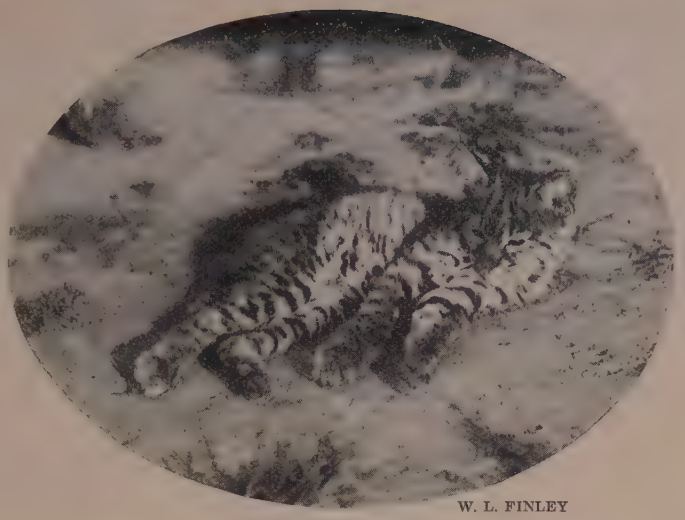
And to whom belongs this wild life that is so fast being sacrificed to greed and vanity, and at such serious cost to our finer qualities, however dulled? These creatures of the wild belong to all of us insofar as we have the mind and the will to appreciate their beauty and companionship. They are a part of that great and glorious heritage that has come to us who read these lines, and to the millions who will never see them, and to our children and their children. And they belong peculiarly to those of us who have not the wish to sacrifice them for our own temporary pleasure or profit. As for those who exploit them, and to whom wild life is valued only in dollars, *they* have long since destroyed their share. And we whose reduced share remains must find some way to keep from being robbed of that moiety yet surviving, that our descendants may know with what manner of creatures this continent was peopled. Our birds are being saved. The few species known to be in danger are being guarded by law and by a public sentiment that yearly grows more wholesome and powerful. Are not our mammals entitled to a consideration as generous and helpful? We have yet learned only a fragment of the truth concerning the relationships of the vast wealth of life that once graced our continent, and every species destroyed or brought to a low ebb makes the problem more intricate.

And who benefits by the appalling destruction that is so fast desolating our forests? Mainly those to whom our wild life means nothing but dollars, or the passing gratification of a whim dictated by the caprices of fashion. By skilful advertising the vanity of age and the recklessness of youth are played upon to the uttermost; the arts of the costumer proceed from season to season, and from year to year, regardless alike of the ever-dwindling ranks of animal life, and the suitability of the finished product—"by saturating the public mind with a desire for furs until that desire is sufficiently strong to brush aside any emotional condition" to quote an official pronouncement. Should the day come when the marten is rated among the animals extinct in our northern forests, a distinction that it has already almost attained in most of our States, what shall avail us the memory of a row of its distorted skins encumbering sleeves already over-ornamented. Time was when the teamster, guiding from his high seat his span in the face of an angry blizzard, needed his coat of raccoon, but the dwindling ranks of this unique animal have placed such a garment beyond the laborer's reach, and

will no longer justify the long coat of the youth lounging bare-headed in his electrically-heated limousine. And what shall one say of the scarf of fox worn in the sweltering heat of July, or the deep hem of badger or otter setting off a garment otherwise selected for coolness rather than warmth? Why should the destruction of our interesting wild creatures be allowed to go on unchecked until we can no longer trace even their footmarks in our forests and by our stream sides? Some of our fur animals, I repeat, are being swept out of existence, and with them is vanishing the opportunity to learn what are their relations to the rest of our fauna and flora. In the clamor raised by efforts to emphasize the destructive food habits of our smaller carnivorous animals we are prone to overlook the vast benefits that accrue from their preying on the rodents that ravage our crops, a function that the furred flesh-eaters share with the feathered guardians of field and wood, the hawks and owls. And as for the esthetic value of these wild creatures, that has received no consideration whatever from those who profit by their destruction.

It is true that great numbers of skins produced by domestic or semi-domestic animals are now utilized, but this supply has in no degree abated the pursuit of our wild fur-bearers, which are everywhere dwindling. The widespread use of furs raised in captivity, and imitations of the more costly kinds, has followed, and is in fact largely the result of, the destruction we deplore. And in the condition that the majority of our wild creatures now find themselves, mere legislative relief such as the shortening of seasons, and this legislation poorly enforced, will not avail, for the reason that such measures seldom or never limit the harvest in accordance with the increase. A fur farmer or stockman who set for himself a killing season of three months, but during that time took every individual he could find, would soon be out of stock. This principle is everywhere recognized in dealing with products privately owned, but is ignored in harvesting our wild life, the product of Nature. Only one exception in our list of wild fur-bearers, the fur seal, comes to mind. This animal dwindled to a pitiful remnant under unrestricted killing, but under a system that allows only the harvesting of a carefully calculated surplus, it is rapidly and steadily increasing.

Thus far we have considered our fur-bearers only in the abstract. Let us briefly view some of them as species and as individuals, and glance at their home life, and review their swift passing.



W. L. FINLEY

A YOUNG BOBCAT

Cats are cats the world over, and this one, though wild, might be a tame tabby

Since earliest recorded times the Old World fox has been justly regarded as one of the most intelligent of animals, in Scripture serving as an example of craft and cunning, and figuring in the proverbs and folklore of many nations. Our red fox, an animal very like its European relative, inhabits most of wooded North America. It is monogamous, and in the care and training of the young is exemplary. Its food consists of a great variety of small animals and birds. Mice of various kinds are a staple, and rabbits, woodchucks, grouse and other birds, and poultry when available, are commonly eaten. The cross, silver, and black foxes are color phases of this species, and successively represent a tendency to complete melanism, or replacement of the normal red color by black. In all phases the tip of the tail is normally white.

The gray fox is confined to North and Central America, and barely extends northward to extreme southern Canada. The animal is much less swift and enduring than the red fox, and apparently has less cunning. It differs also in important structural characters, and unlike all other foxes, is an expert climber. Usually a sloping trunk is selected for this feat, but often a tree with numerous low limbs will serve as a refuge, and rarely one that is limbless and perpendicular. The den is frequently a hollow log, or a cavity among rocks. The young, three to five in number, are born in spring. The food consists of a great variety of

CORNELIA CLARKE

MUSKRAT HOMES

Made solid by the frost, the house of this animal spells safety

forest products, small mammals, birds, snakes, lizards, young turtles, crayfish, insects, many species of berries and other fruits, and sometimes poultry.

The Arctic or white fox is circumpolar in range. Its normal summer pelage is dark brown on the back, shoulders, and hips, and tawny on the sides; in winter it is pure white. A dark color-phase is the so-called blue fox. In the summer of the Arctic, food is plentiful; birds, mice, and lemmings of several species are found, besides much invertebrate life. Though the foxes store food, the supply is never sufficient for the winter and most of them wander southward. Few ever live to return northward, for the trappers, the larger predators, and starvation overtake the majority.

The den of the mother fox is found among rocks, or is dug in a gravelly or sandy tract, and usually has several entrances. The young, usually born in June, are scarcely larger than mice, weighing only 2½ ounces. The old ones usually weigh from eight to ten pounds. The individuals that winter in the remote Arctic, unless they find the stranded body of a whale or other large mammals, lead a miserable existence; many associate themselves with the polar bear, following him about in his wanderings, and eating whatever scraps may remain from his meager banquets.

W. L. FINLEY

WEASEL IN SUMMER

This little animal is the embodiment of mental alertness and physical energy

The kit or swift fox is an inhabitant of the treeless prairies and deserts of our West from the Saskatchewan plains to Texas and California. The young are born in the well-protected nest of grass in the many-branched burrow. The food consists largely of mice and other small rodents, birds, and probably insects. The fur has never been in demand, the price ranging from a shilling in early days to a few dollars in recent years. However, the animal has been nearly exterminated in most parts of its range. Very little has been learned of its intimate habits and home life, and unless the hand of man is stayed in its persecution, this beautiful little creature, found nowhere else in the world, will soon be only a vague memory.

The fisher, most closely related to the marten, is exclusively American, inhabiting a rather narrow range from Nova Scotia to northwestern British Columbia, and in the Alleghanies, Rocky Mountains, and Sierra-Cascade ranges. It was never a common species anywhere, and the effect of settlement and unrestricted trapping has been its virtual extinction over most of its range; yet it still has little protection, and the high price that the skin commands insures its continued pursuit. In most of our States, it has ceased to figure appreciably in the fur returns yet its destruction goes on.

Mice and other small rodents form the bulk of the fisher's food, and rabbits, squirrels, frogs, and even fruit are eaten. It has become so scarce, however, that its food habits have little economic significance. Little is known of its habits. The den is usually built in a hollow tree; the young are usually two or three, and are born in early May. The adults usually weigh from ten to twelve pounds.

The marten, the American representative of the famed sable, has an extensive range, from the limit of tree growth south to Pennsylvania and Wisconsin, though it is now extremely scarce in the East, and in the West, where it was formerly common, it has become greatly reduced. It is fond of evergreen woods, and is also partial to burned-over sections, being attracted by the mice that abound there after the fruit-bearing shrubs spring up. In the forest it is one of the most agile and graceful of animals, and he who has been privileged to see one wild and unafraid in its haunts, will long retain the picture as one of his outstanding experiences.

The home of the marten is usually a hollow tree with a nest of grass and moss, where the young, usually three or four, are born in spring. Mice and other small rodents form the bulk of the food, and it also eats many birds as well as squirrels, rabbits, frogs and other amphibians, insects, and even berries.

The mink, *Lutreola vison,* is one of the staple fur-bearers, and ranges over much of wooded North America. With the form and general habits of the weasels, it has the added ability of aquatic skill. Its favorite food is fish, but it eats also crayfish, frogs, clams, and a great variety of small birds and mammals. The home is generally a burrow in the bank of a stream, sometimes occupied for many years by successive generations. The young, generally born in late spring, vary from three to ten in number. They are cared for by the parents for two or three months, and in early fall seek hunting grounds for themselves.

The weasel, whose white winter coat forms the ermine of commerce, is found in various forms from the Arctics to the Tropics. It would seem as if Nature had in mind a machine for keeping in check the hordes of mice and other rodents that without some restraining agency would devastate the earth, for the weasel has been evolved in a variety of sizes, the smallest of which traverse with ease the burrows of the lesser mice, while the largest approach in size the mink and marten, and prey on larger species.

The predatory habits of

IN HIS *article Mr. Preble speaks of the supreme sacrifice our fur-bearers must make to yield their coats to commerce. But how is this sacrifice often made? It comes between the cruel and relentless jaws of a trap of steel, in whose embrace are grinding pain, torture of hunger and thirst and the horror of slow death. The trapped animal, should he live shorn of a shattered limb, cannot tell the story of his suffering; but there are trappers who have been caught in their own traps and rescued as life ebbed, or who have found the heart that is in them when watching the tortures of a trapped animal and have trapped no more, who can tell the story of the skin hanging so gracefully in the show-window.*

the weasel sometimes lead some individuals into bad habits about the farm, but the majority are not harmful, and instances are on record of weasels that have lived for months about farm buildings without once harming the fowls, though destroying innumerable mice. Besides these small creatures the weasel preys on a great variety of other small mammals and some birds. The young are from three to nine in number.

In the wolverine we have one of the most interesting of our animals, circumpolar in range. In form it represents the extreme of robustness among the weasel tribe, and its name is a synonym for enduring strength and ferocity. All is meat that comes the way of the wolverine, from the caribou or deer killed by the woodsman, to the bait of traps set for other fur-bearers. Its propensity for following a line of traps and eating the baits or the captured game has made it one of the most detested of all our animals. It subsists to some extent on large animals killed by other species, and has been known to drive from its prey a wolf that had killed a caribou. Rarely it has been known to kill even the moose, but such instances are very rare. Mice and ground squirrels are eaten whenever they can be captured. The wolverine has its young, two to four in number, in spring or early summer. The den is usually among rocks.

The badger, *Taxidea taxus,* formerly ranged from Ohio to the Pacific, and from the Saskatchewan to Mexico. Its good offices in destroying harmful rodents is little appreciated, and it is fast disappearing in most parts of its range. Its skill as a burrower, which explains its prowess as a rodent hunter, is extraordinary.

The skunks are exclusively American animals, and are known to everyone. All the species of the weasel group are furnished by Nature with a powerful secretion and this has been developed by the skunks to a degree that permits of its use as a defensive weapon. The animal, however, has many admirable qualities, one being his invariable tendency to attend to his own business.

The large skunks, *Mephitis,* inhabit in some form most of the forested parts of North America. They have large families, from four to ten young, born in late spring, and this fecundity has enabled them to withstand the ravages of the trapper better than any other of our fur-bearers. There are few prettier sights in Nature than a mother skunk leading abroad her family of babies, perhaps no larger than chipmunks, each a replica of herself.

The skunk is omnivorous and this trait leads him into trouble when he invades the hen house. The great bulk of his food, however, is procured in the wild, and includes meadow mice, and many insects, especially grasshoppers and crickets and the larvae of destructive beetles.

Less well known is the little spotted skunk of our southern and western states, slenderer and more graceful in form, and more lively in its movements. Its food habits resemble those of its larger cousin, and it is similarly armed for defense. It is sometimes known in the trade as the civet cat.

In the otter, nature has given us an animal in which adaptation to an aquatic life has reached a high state of perfection. Fish is its normal food, but if other water life, such as crawfish, abounds, there the otter is content. For many years the trail of an otter in the soft snow has been a sight so rare that thousands of nature lovers and woodsmen, even in our wilder sections, scarcely know it. The den is a burrow in the bank of a stream or lake, usually with the entrance under water.

The sea otter, which produces the most beautiful fur known, inhabited exclusively the shores and islands of the North Pacific Ocean and Bering Sea, south to northern Lower California and the Sea of Okhotsk. On the coast of Kamchatka, where the animal was discovered by the Russians about the close of the seventeenth century, it became very scarce within fifty years. The Commander Islands and the Aleutians were the next to be exploited, and then the Pribilofs. During the nineteenth century, the pursuit of the dwindling remnant was unceasing, and a few years ago it was realized that this beautiful and harmless creature had been shot, clubbed, and netted almost out of existence. At present it is protected by law, but even now the slaughter of the pitiful remnant has not stopped.

The sea otter lived among the kelp beds, coming ashore at intervals to rest, and to give birth to its single young one, but being otherwise independent of the land. The mother is said to care for her baby with great solicitude, bearing it on her breast as she floats on the sea, and if attacked defending it unto death. The food of the animal consists of the shell-fish and other invertebrates that abound in its haunts, and which are secured by diving.

The bassariscus, a long-tailed animal of our southwest, which for want of a good distinctive name is called the ring-tailed cat or civet cat, is an interesting though rather rare fur-bearer. It is partial to rocky country, and has its den in caves and clefts.

The raccoon, *Procyon lotor,* is a distinctively American animal found from southern Canada southward. The young, usually four to six, are born in spring in a tree retreat. It is fond of the waterside, and carefully washes all its food. Its fur was formerly considered coarse, but is now in great demand, and its numbers are fast decreasing. It hibernates during the colder months.

The beaver, *Castor canadensis,* in primitive times occupied almost the entire extent of North America, excepting the region north of the tree limit and the arid deserts of the West. The unrelenting pursuit of the animal for fur long ago almost depopulated most of the States, and some of the Canadian provinces also. Within recent years, however, the beaver has been protected in many places, and in some has so increased that a surplus has been available for stocking sections long depleted. Animals that have been captured in cage traps, if treated gently, usually become within a few hours so tame that they may be handled readily, their great intelligence enabling them to perceive that no harm is intended. The beaver's skill as an engineer, that enables it to build and maintain dams and canals, have made it world famous.

The muskrat, *Fiber zibethicus,* is found over most of North America, exclusive of the treeless Artic and the deserts. The numbers gathered in the fur trade exceed all other species combined, but such is the fecundity of the animal that it still persists in all parts of its original range. It has been amply demonstrated, however, that even the muskrat cannot stand unrestricted trapping, despite its large families.

ANGEL of the CHRISTMAS TREE

by Tom Gill

(Decorations by R. Bruce Horsfall)

IT WAS in a particularly remote corner of Paradise. From very far away came a sound as of many voices and the radiance of a great light that touched into living color a myriad lofty spires. But the two white-robed figures in this remote corner were looking not at the lofty spires, but out across the night to where, infinitely distant, earth glittered like a great star. The taller angel nodded.

"Yes, you are right," he said after a time to him who stood so quietly at his side.

"Yet I spoke no word," replied the other.

"Ah, but you were thinking that tonight earth gleams with a greater splendor than you have ever known. That is because tonight on earth is Christmas Eve."

"Can it be, then, the lights of their Christmas festival show even so far away?"

The tall angel smiled—his lips seemed always just ready to smile. "Not the lights, but the spirit of their Christmas festival. For you must know that it is only happiness and compassion that make Earth bright. After all, one thought or one smile of true gentleness may hold more radiance than a million suns."

The other pondered while out of the blackness a comet roared blazing by them, then faded back into the night again. Curiously the younger angel looked at his companion.

"And it seems that tonight about you, too, a new light hovers. It glows on the tips of your wings and above your head."

Again the kindly gray-eyed angel smiled. "That also is because Christmas Eve has come. For had you been longer in Paradise you would know that here they call me the *Angel of the Christmas Tree.*"

"Why?"

"Because very long ago I taught men to choose each year a tree and set it in their midst as a symbol of love and service and beauty."

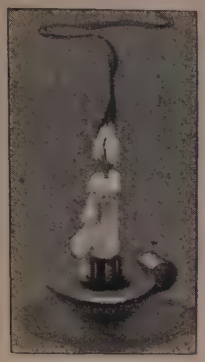
"But why a tree?"

"What else? What is more beautiful or of more steadfast service to man? Is it not written '*The tree of the field is man's life*'? I gave to the world this custom, this festival of the Christmas tree, and so it has come about that once each year He Who Governs All permits me to return to earth and walk with men again. To talk with them, and to perform three deeds of kindness there on Christmas Eve."

"Take me with you, Angel of the Christmas Tree."

The kindly gray eyes smiled again. "That I cannot do. But, perhaps, I shall tell you what I learn down there. And so for a little time, farewell."

Then those luminous



wings softly opened and a gentle whirring sounded high in the air above the younger angel's head. He looked up and found himself alone.

It was a great eastern city, long lighted streets aglitter with the splendor of Christmas Eve. Bright shop windows bulged with the wealth of good things they held. Children ran in and out those lighted shops buying nuts and candy toys and from everywhere rainbows of colored lights blazed. As far down the long, crowded street as one might see, a happy throng moved and called and nodded to one another as they passed. The night was fragrant with the aroma of fir and spruce boughs and before doors and windows red-berried holly hung in wreaths and long festoons. There was laughter and the tread of many feet and over all the spirit of that most wonderful of old earth's holidays.

No one seemed to notice the tall, gray-eyed stranger who walked so quietly among the happy holiday crowds. Yet wherever he went it seemed as if men's smiles were a little gayer and their greetings a little warmer. Once as he passed a little child looked up and smiled at him as in some secret understanding. But leaving the main avenue for a time, the gray-eyed stranger pursued a darker, narrower street faced with stern brick dwellings that frowned in eternal disapproval across the gloomy spaces. No stretch of lawn, no tree. Just a wilderness of brick. Not a twig, not a blade of grass. The angel shuddered.

"Why," he asked softly, "why did they make it so ugly, as if beauty were sin? They have forgotten the most important part—trees. Trees to tell these city dwellers when spring is come and in summer to be playgrounds for the birds."

He made a quick motion and now on every side great massive elms had arisen, their graceful branches etching a delicate lace-like tracery against the winter sky. Somehow the houses seemed more friendly now—in some mysterious way they had become homes. The angel smiled.

"There," he whispered, "that's better."

Then with the same soft whirring of wings the angel went swiftly westward over many cities large and small and he came at length to a great river. On the banks of this river stood another city with tall buildings and broad avenues where lights of red and green and yellow nodded and beckoned to the holiday makers. Among these for a time the tall stranger walked and here, too, it was as if some bearer of great happiness and joy had passed. But once he turned aside into a low hall where a man on a raised platform was speaking.

"Now consider," the orator was shouting, "consider this wastage of Christmas trees. Here we stand upon the brink of a timber famine. We are cutting timber nearly five times as fast as it grows. We need every tree. How can we excuse this cutting of millions of trees every Christmas? Trees used for a short time only, then thrown aside! What is our excuse for that?" His voice thundered to the question, then ceased.

"I had always thought the excuse was that it brought happiness to the world," came the quiet voice of the stranger, bell clear in the little room.

"But the waste," challenged the orator.

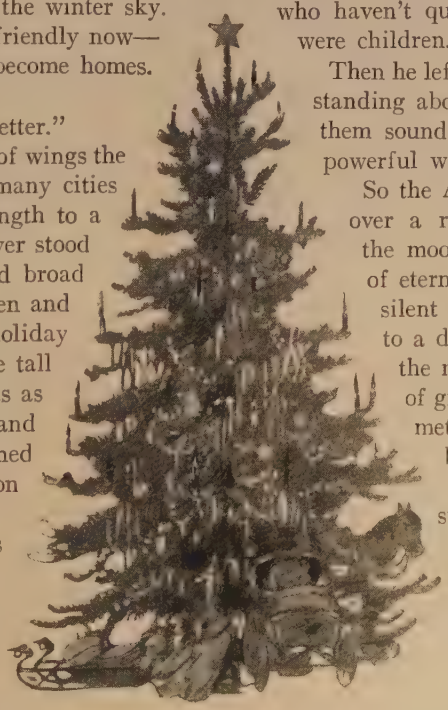
"I wonder," that clear voice answered slowly. "I wonder if anything that brings joy to little children can be called waste. I wonder, too, if these trees that serve as beautiful symbols are not carrying out their own great purpose to mankind just as the trees that go to make boards or paper. You see," the clear voice added a little apologetically, "I am a stranger here and I am wondering."

"My dear sir, are you aware that the use of decorated trees is, in the first place, a pagan custom?"

"Yes, I suppose so. It is so very old. But then, you see, it is a beautiful custom and all beauty is a prayer to the One God."

The orator waved that aside. "Where else do we permit a waste of trees that compares with this Christmas tree waste?"

The angel smiled. "Aren't there a good many books in the world that might just as well never have been written? Yet the paper for these have cost the forests millions of trees. And you know I was thinking just then of tooth picks. Now, I've never used a tooth pick, but if you really want to save wood—there's a way. I'm told that each year more trees are cut for tooth picks than for Christmas trees. So," and here his kindly face grew grave again, "let's not abolish the Christmas tree. It means so very much to so many children in the world and to all who haven't quite forgotten they once themselves were children."



Then he left the little hall and it seemed to those standing about the door that in the night above them sounded a soft whirring like the beat of powerful wings.

So the Angel of the Christmas Tree passed over a range of high mountains where in the moonlight glistened the white splendor of eternal snows. Then over a great desert, silent and deathlike, and at last he came to a dense forest not far from the sea. In the midst of the forest was a low house of gray and green where the tall stranger met a tanned young man wearing the badge of a Forest Ranger.

"What a delightful spot," said the stranger.

"This," the Forest Ranger replied, "is California."

His tall visitor bowed. "Ah, yes. Even a stranger from distant lands has heard of California."

"You bet. And when you've been

here a while, you'll sure hate to go home. Climate there will seem a bit flat."

"Well," the gray eyes looked whimsically at the ranger, "my own land has been praised rather highly, too. Although," he added quickly, "not in exactly the same terms as your California."

Out of politeness the ranger did not pursue his advantage.

"But," the gray-eyed stranger went on, "I'm worried about one thing. Not long ago I heard a man say we should stop using Christmas trees. Are trees so scarce?"

"Trees are getting scarce, no mistake, and we'll have to be a lot more careful than we have been in the past. But don't let any one scare you about Christmas trees. They aren't a drop in the bucket. Besides, the way to do is to take your Christmas trees from places where they grow too thick for their own good. We cut one here and one there and the forest is really thriftier and better off without them. No, the chap who was worrying over Christmas trees is sure looking for something to gloom about. He'd better spend his time and energy preaching against forest fires."

"I'm glad to hear you say that. You see, I've always been interested in Christmas trees."

The ranger had picked up his battered Stetson. "In that case, better come down the trail a ways. A family's moved in down there. Easterners. Oldish man and two kids. They'll be lonesome their first Christmas in a new country, so I'm going to let the kids pick out a tree and cut it for them. It'll kinda help."

For a moment the tall stranger laid his hand upon the other's shoulder. "My friend," he said softly, "I shouldn't be at all surprised if you find a promotion in your next mail."

The ranger laughed. "That would help, too—but I'm sure not figuring on it."

So in the frosty starlit night they went down a dim trail to where the lights of a little cabin gleamed. At a table inside they could see a man and two children sitting—a boy of twelve and a girl who may have been six, or perhaps seven.

"Lungs not too good," the ranger whispered. "Had to come west and live outdoors."

They went in. And with the tall stranger's entrance the lamp on the table brightened and the little room seemed more cheery than before. The girl who had been drowsing in a chair, opened her eyes and running to the stranger, climbed confidently into his arms. The old man stared.

"Now that's funny. All day Helen's been too sick even to walk about. Why, all the fever's gone out of her eyes."

The tall visitor ran his fingers ever so lightly through the girl's soft hair. "She's all right now," he smiled.

The ranger cleared his throat. "We thought you'd be wanting a Christmas tree for the kids, so I just came down to find out what kind you liked. Got any variety on this ranger district, so just ask for what you like best. Yellow pine, sugar pine, cedar, mountain hemlock. . . ."

"A fir tree. An eastern fir," the boy and girl shouted together.

The old man nodded. "That's our favorite back there, the balsam fir. Could you get us one? It would be like a breath of home."

Slowly the ranger shook his head. "Now, don't that beat the very dickens. Balsam fir is one kind we don't have. I could get you a Douglas fir though, or a white fir. 'Course there's not much smell to 'em."

"Don't you bother," said the old man. "Why, we wouldn't have anything to trim a tree with, if you got it. Just don't bother about it."

But the girl's eyes were wide and bright with memories. "Please, I'd like so much a fir tree, the smelly kind."

The ranger stood perplexed. "Ain't it the very dickens," he repeated.

Then he stopped for the gray-eyed stranger had made a little gesture toward the door and, as he did so, there came a knock and a small figure entered laden with parcels. The ranger gave a low whistle of astonishment.

"You making a second trip today, Judd? Thought your old flivver passed me hours ago."

"Holiday season," came the muffled reply. "Early and late on the road in holiday season." Then he turned to the man. "Here's some boxes, four—five boxes from the East. And a letter."

With whoops of delight the children were already tearing at the wrappings revealing with little ecstatic shouts toys, a fruitcake, candy, Christmas greens, more toys, wonderfully new shiny toys, and a whole box of tree decorations. The old man looked up from his letter.

"It's from my brother." His voice was the least bit husky. "I haven't heard from him in years. He tells me not to worry about anything and that he's coming out to see me in the spring." Then he blew his nose and pretended to be very closely examining the parcels. The little man bustled in again.

"Almost forgot," he shouted, "there's a tree came along, too." In a great expectant silence he stood up a tree so tall its graceful spire-like tip brushed the ceiling and its fresh fragrance filled every corner of the room. And for those three aliens in a strange land that perfume was alive with precious far-off memories.

"A balsam fir," three happy, amazed voices shouted.

"Yes," added the tall stranger quietly. "It is a very beautiful tree, the balsam fir. Well, you'll be busy trimming it and I have quite a distance to go tonight, so—

good luck to one and all and Merry Christmas."

Eyes filled with a new happiness, the little child threw both arms about his neck and kissed him. Outside the Forest Ranger waited in deep perplexity.

"Sure gets me," he confided. "That tree's come from back East and by the freshness of it, I'd swear it hadn't been cut two hours."

The gray eyes of the stranger looked blandly down. "Yes," he replied, "the speed of the mail grows more wonderful every year."

Then they shook hands and a moment later there came to the Ranger a soft whirring high up in the starry sky. "Another snow owl," he commented and turned toward home.

And in that same remote corner of Paradise the gray-eyed angel was resting, looking back at earth, now pink and glowing in the first thread-like rays of early dawn.

"What did you learn down there, Angel of the Christmas Tree?"

The kindly gray eyes grew even softer. "Why, a very deep truth—that whatever brings beauty and happiness is never really wasted."

"Formica Transportation Co., Ltd."

by H. T. Oberg

I was visiting friends in an old New England town It was a bright Sunday morning, and we were all preparing for church. As I was ready before the members of the family, I awaited them on the walk before the house.

Suddenly I saw quite a disturbance among the blades of grass edging the walk on the side nearest to me. Presently there emerged an ant, which had after the struggle just mentioned, at last succeeded in passing some final obstructions encountered on that side of the road. Imagine my surprise on seeing what had prevented the progress of the little disturber, and caused all the commotion I had just witnessed; she was dragging along with all her might, the wing of a moth, many times larger than herself! The weight of the load must surely have been greater than her own, and the size of the wing no doubt also rendered its transportation very difficult for the tiny laborer.

THE TRANSPORTATION COMPANY AT WORK

The ability of ants to carry tid-bits of such size is always fascinating

I was impressed however, by the very intelligent way in which the little worker had gripped her prize, for she was carrying the wing by the end which had been attached to the body of the moth. This was naturally the longest and most tapering point of the approximate triangle which it formed, and would therefore more readily pass between the blades of grass, and around or over stones or other obstructions which might be encountered.

The dauntless little worker had now reached the smooth sanded path, where she stopped for a moment to rest; suddenly she again took up her precious burden, crossed the walk in an almost perfectly straight line, not pausing until she reached the edge of the grass on the opposite side of the path. Here she paused for a moment to rest and *think!* Then this interesting little athlete again started in with a will, to pull her great treasure to the desired destination.

She succeeded in passing through the outer and thinner fringe of grass, but had not proceeded very far before the new difficulties here met evidently became insurmountable. After making three attempts to proceed, my persistent friend gave up in despair, and sped rapidly away in the direction in which she had started to transport the precious morsel.

But just at this most interesting point, the friends for whom I had been waiting appeared, and I was therefore obliged reluctantly to abandon my watch. I am perfectly sure however, that Miss Formica was just then hurrying to her home, which certainly lay in the direction she was coursing, to enlist the help of some other members of her tribe, in the hope that their united efforts might accomplish the task of adding this choice tid-bit, that seemed to defy her strength, to the family larder!

NURSERY NATURE TALES

Being the Adventures of Toby and Beth, Two Very Little People in the Big World

CHRISTMAS TREES

by Elizabeth K. Peeples

"WHO wants to help get a Christmas tree?" called Daddy.

"We do! We do!" cried Toby and Beth running after him as he strode down the lane, an axe over his shoulder.

"We want a green tree," said Beth looking at the pines with their green needles, and the bare branches of other trees close by.

"There's a pretty one. Let's get it," exclaimed Toby pointing to a little pine tree.

"No, it isn't ours," said Daddy. "We must get one from our own woods, not from Farmer Brown's."

"But suppose we hadn't any woods," said Toby.

"Then we'd buy a Christmas tree," Daddy answered.

Soon they reached their very own woodlot. Toby and Beth ran about in great excitement looking for the pine tree they liked best.

"Our Christmas tree must be very straight, so it will point right to the stars," said Toby.

"It must be just as big on one side as it is on the other, so it will hold all our red balls," said Beth.

"Here is a good one," cried Toby, but just as Daddy swung the axe, he darted away with a shout, "Here's a better one."

Daddy stopped his axe in mid-air.

"This won't do, Toby mine," he said quite seriously. "We can only cut one tree. Be sure you know which one you want."

"Why, the wood is full of trees. What difference does it make?" asked Toby in surprise.

"It takes years to grow these little pine trees, more years than you and Beth have lived," answered Daddy. "Everybody wants a Christmas tree. If everybody takes one it is all right, but if everybody cuts two or three, what will happen?"

Toby and Beth looked soberly at Daddy. Then they said, "There won't be any!"

"I'll be careful this time," added Toby as he pointed out the tree he wanted.

On the way home what should they find in the woods but a holly tree full of bright red berries.

"Oh, so pretty!" murmured fat little Beth. "Let's take it home to Mother."

"That's what people have done until there is very little holly left growing. Let's leave this pretty tree in the woods, and bring Mother here to see it," suggested Daddy.

Just then a little bird with brown feathers, a tuft on its head, a yellow band across the end of its tail, and tips like red sealing-wax on its wings, flew into the holly tree, and began eating berries.

"Why the holly tree is a Christmas tree for the birds!" whispered Toby, his eyes shining. Then all at once he began to clap his hands and jump up and down. "Oh, goody!" he cried, "I'm going to make a Christmas tree in our yard for the birds. We can tie suet and peanuts on it, and little baskets of crumbs."

Beth looked imploringly at him. She loved Toby and she loved the birds, but,—

"I want my Christmas tree with red balls."

"Never mind, we'll have both," said Daddy. "First we'll put the little pine tree indoors. Then when Christmas is over, we'll put it outside, too."

CARL AKELEY INSPECTING THE TUSKS

The cartoons are by John T. McCutcheon, done on a menu card at a party given to the Akeleys

My Friend "AKE"

by C. L. Dewey

WHEN you have given a man the best you have for nearly a score of years, you grow to know him and to learn somewhat of how he accomplished the things that no man before him had done. Such was my privilege with Carl Akeley, whose spirit so recently departed from his worn out body on Mount Mikeno, the home of the gorilla, that man-animal that Akeley, better than any man, knew and respected.

If "Ake" could have decreed exactly his departing into the Beyond he would have selected this spot which he loved better than any other, but he probably would have delayed the time until he had finished the work in hand. Even so, Ake always laid the foundations for the next monument long before the one uppermost in his brain had reared its spire far and above its neighbors. We like to think that it pleased him just as it happened, but I have a notion, although Ake went "with his boots on," as he often told me he wanted to, that if he could have ordered it exactly as he wanted, it would have been in a melee like the time he killed the leopard with his bare hands and a sharp elbow in the desert gully in Somaliland; or when the long horned rhino backed him up against the ant hill on the banks of the Tana; or when the big bull elephant used him as a prayer mat on the slopes of Kenia; or the time his log dugout, cruising the shore of Victoria, ran on the sleeping hippo.

RHINO LOOKING FOR AKELEY

His Hideous Highness out taking chances on being a part of a habitat group

The number of boys, girls, men and women who have wanted to work for and with Akeley, is unbelievable. Love of Nature, love of the outdoors, and love of animals were the first things that Akeley inquired about of the applicant. Then he wanted to know what you knew about the job that you wanted, and this generally led to downfall. I came out of the tall sticks to ask Akeley for a job, and when I pleaded ignorance of any knowledge whatsoever of the workings of taxidermy and kindred arts, he said he would give me the job if I was sure that I knew nothing about it. He had tried for some years, he said, to break in a young man for the particular job that he thought I might fill, but they all knew so much about the work they couldn't learn anything from him.

The first trip afield that I made with Akeley was into the lake region of northern Illinois to collect material for the projected Illinois Bird Room for the Field Museum of Natural History, then known as the Field Columbian Museum of Chicago. This plan of presenting the birds of Illinois in their natural surroundings, with photographically reproduced colored transparent background and complete

AT THE WATER HOLE
Comes the Beisa antelope to have a cooling drink

making plaster casts of leaves and flowers, taking color notes, and other detailed work. Akeley knew just what colors of oil paint and what proportions to use to reproduce in colored wax the first light yellow green leaves of the early-leafing willow as a setting for the early-nesting yellow warbler, or the dark green oak leaf of the mid-summer nesting cedar waxwing. Nothing escaped him to the last detail, nothing was too difficult if it accomplished the desired results.

One day we were returning to camp from a water bird collecting trip, in a small duck boat, when a terrific electrical and wind storm came up and partly filled the boat with water. As we were a half mile from solid land and drifting toward an extremely marshy shore, it looked as if we might have to swim for it. I then learned that Akeley could not swim a stroke. Said he never had time to learn to swim as a boy, and that he had never found it necessary as a man, and he guessed he would get out some way this time. So we sat in the water filled boat and laughed, and the wind went down and we bailed out the boat and paddled on to camp.

THE ELEPHANTS ARRIVE
They, too, find the water hole a welcome oasis of the wild

The papier-maché manikin method developed by Akeley through years of experimenting worked wonders with mammals such as deer and antelope groups, but was not practical for the immense size of a bull elephant. Many years ago Akeley had mounted, or stuffed, as it was termed, Jumbo, the circus elephant that tried to butt off the track a full sized locomotive and gave up his elephantine ghost in the attempt. Since then Akeley had developed in his mind a complete method of mounting one of these huge beasts and the two enormous skins and skulls which he brought back from Africa in 1906 gave him ample opportunity to execute his plan. He first modeled in clay accurate replicas in miniature exactly one-twelfth size of the original animals, working to measurements and photos taken in Africa immediately after the elephants were shot. These were modeled as two fighting bulls, one single tusker attacking the

RESTING ON HIS LAURELS
Akeley reclining on a big bull elephant he has captured

slightly larger bull, standing on three feet, one foot raised slightly off the ground, with tusks and trunk raised in the air nearly seventeen feet high. Working to this model we laid out with crayons full size on the studio floor, the outline of one of the pachyderms, and inside this outline a back bone, neck and legs of structural steel, much as if we had intended to build a steel bridge. The back bone and corresponding members in the elephant's "tummy" were made of two four inch steel channels, back to back, separated by means of two inch by four inch lumber about thirty inches long, spaced about two feet apart and standing vertically like spines in some pre-historic dinosaur. Heavy bolts passing through both channels between each pair of uprights clamped the uprights securely, and permitted adjustments for working out details in contour. The ribs were worked out with curved steel angles of suitable weight.

FOR THIRSTY GIRAFFES
The water hole is the most popular resort in the wild

Akeley modeled the head full size in clay over the immense skull with the huge tusks in position. A plaster cast in four sections was then made of the completed model. This cast, when hardened and removed, served as a mold or form into which was fabricated a light steel frame-work following out in detail the plaster mold. This steel-head-skeleton was then added to the body structure and in this manner the complete steel skeleton was constructed. The body or shell was formed of one inch square wire loosely woven so that it was capable of warping without buckling. The ears were made of lighter wire mesh over a light steel frame, as was the trunk, two small steel pipes running the full length of the trunk, raised high in the air. Over this entire steel and mesh frame was plastered by hand a mixture of plaster of Paris and tow, this being like unwoven rope, to a thickness of about one inch.

THE RHINOS COME, TOO
It is a truly cosmopolitan gathering that assembles

When this was completed, there stood an elephant minus his hide, twelve times the size of the working model and exactly his counterpart as he roamed the slopes of Kenia for probably more than a century.

It is a problem successfully to bring out of Africa the skin of an elephant in condition fit to mount. These huge hides are from an inch to two inches in thickness when removed from the carcass. They are cut in five or six pieces and immediately work must be started in the dense wet bamboo forests to pare the skin down by hand to a thickness of about one half inch. These are then heavily salted and loosely rolled together, bound securely in native cloth, and made ready for transportation many miles to the nearest point where oxen could be secured. Each section would weigh several hundred pounds and be carried by eight or ten native porters

ONE OF THE TUSKERS
This was placed in the Akeley group at the Field Museum

the huge tuskers; but meanwhile get one or two moderate tuskers as an insurance. I am too proud of your work, and too interested in it, to be willing to see any risk run that is unnecessary.

Your friend
Theodore Roosevelt.

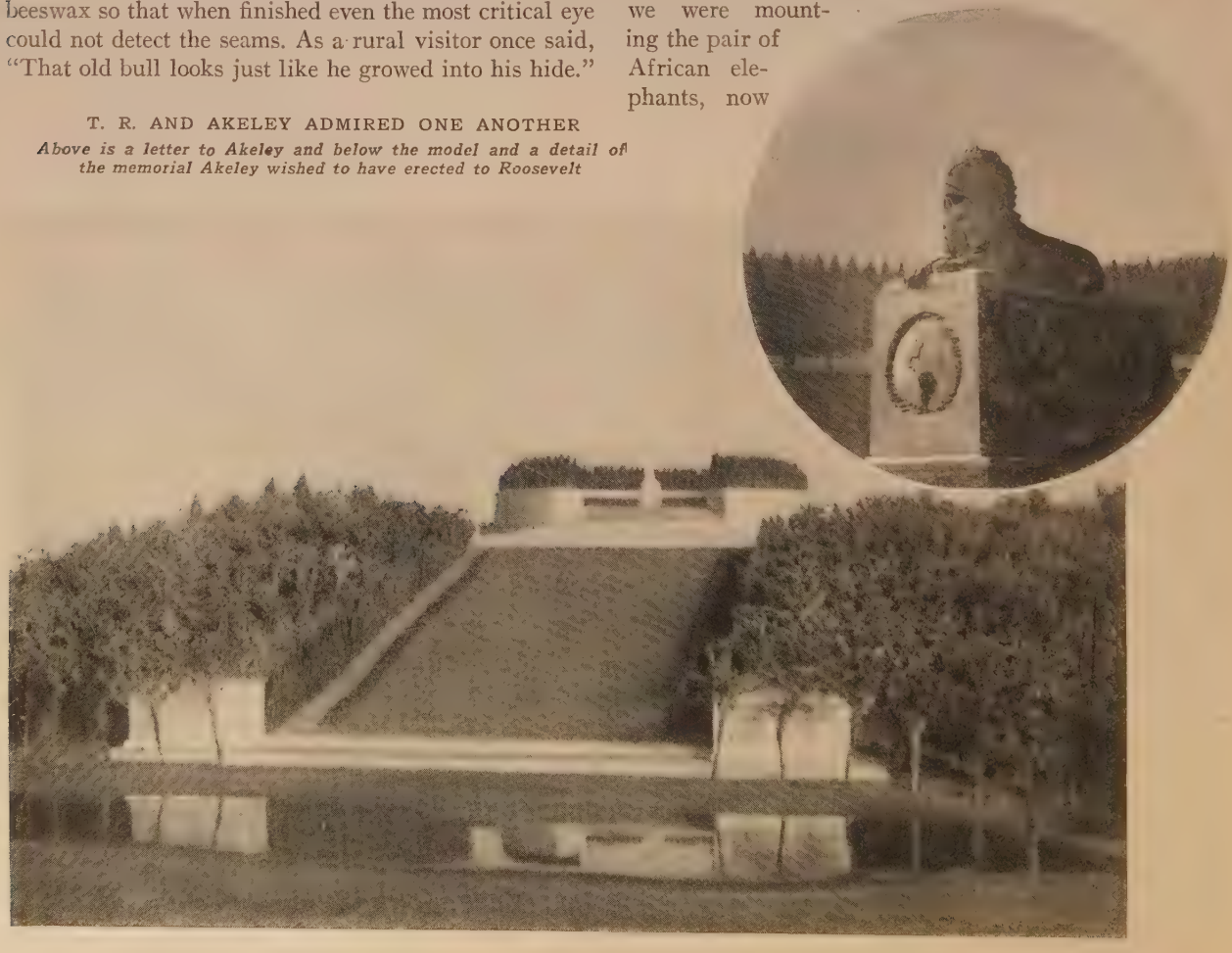
for the magnificent sum of thirty cents per month—and grub.

To mount "green" skins is not practical, so Akeley developed a special method of tanning never before used. As a result the elephant skins were turned into a high grade leather hide presenting the same exterior as worn by "Tembo" in his native haunts,—sparse, stiff hairs, wrinkles, warts, tick-holes and all. The big sections of skin were first laid in their proper position on the finished manikin and by means of huge syringes somewhat like the present day auto grease gun, a mixture of hydrated plaster of Paris and glue was shot in under the skin through small slits easily closed, and then the skin modeled into shape with numerous wrinkles as in actual life, the plaster of Paris and glue hardening and holding the skin in exact position. Akeley did practically all of this modeling with his own hands. The edges of each section were then sewed together with hidden stitches and filled with colored beeswax so that when finished even the most critical eye could not detect the seams. As a rural visitor once said, "That old bull looks just like he growed into his hide."

Akeley could work more hours per day without being mentally and physically exhausted than any man I have ever known. The only time I ever heard him suggest even a temporary let-up was in his dry joking manner one morning several days before his departure for Africa in 1909. We were doing some development work on the cement-gun in a shop near the Field Museum, and it was our custom at that particular time to work about two hours each day before breakfast, then grab a few bites and walk to the museum. On this particular day I happened to be about one step ahead of Ake when he grabbed me by the coat tail and said, "Slow up a bit. This is the only time we get a chance to rest these days, when walking from one job to another."

There have been many stories told as to the origin of the cement-gun, the invention for which Akeley received the Scott Medal issued by the Franklin Institute of Philadelphia. The generally accepted story is that Ake developed this for use in constructing plaster manikins for huge mammals such as elephants and rhinos, but this is not true. At no time did Akeley seriously consider this, but it made an acceptable story so he let it go at that.

The Field Columbian Museum of Chicago in 1907 occupied the old Art Building built in 1892 for the Chicago World's Fair, constructed of brick with plastered exterior, the plaster of Paris or staff columns and trim. It presented a sorry spectacle in 1907. One day F. J. V. Skiff, the Director of the Museum, was in Akeley's studio where we were mounting the pair of African elephants, now



T. R. AND AKELEY ADMIRED ONE ANOTHER

Above is a letter to Akeley and below the model and a detail of the memorial Akeley wished to have erected to Roosevelt

the center of all exhibits in the new Field Museum. I was at the time using an enlarged handmade atomizer operated by compressed air, to paint some imitation rocks for another group under construction, using a combination of thin, colored plaster of Paris. Mr. Skiff, who generally brought all of his troubles to Akeley, was talking about the complaint that he received from the South Park Board regarding the condition of the exterior of the Museum. He said that no painting or plastering contractor could be found who would take the chance on the job, and while talking he suddenly said, "Ake, why can't you and Dewey make a big machine like that squirt-gun that Dewey is using, and paint this old shack with plaster of Paris?" It never took much of a hint to start Akeley off on a new idea, so at once we started to develop a big "squirt-gun." These walls consisted of plaster, brick, concrete, wood, tin, iron, copper, tar paper and about everything that could be assembled together on one building, and as this structure covered several acres there was ample space for a generous assortment.

THIS IS A SYNTHETIC PICTURE

The fighting elephants at the American Museum are photographed against the background of Mt. Kenia, British East Africa

The method of mixing plaster and water in a container under pressure and then spraying out in a hydrated state, worked fairly well when only a few feet of hose was used, but when this was attempted with the machine on the ground and the nozzle operator fifty or seventy-five feet up on a swinging scaffold, the plaster began to set in the hose after a few minutes' operation and soon the hose plugged tight. We then worked out a method of shooting hydrated plaster through the hose for a few minutes and then by means of a three-way valve we shot through water to clean out the hose, and then back to the hydrated plaster again. This, however, was a very messy operation and was abandoned. Then one morning Ake came in and said, "We're on the wrong track. What we want to do is build a machine to handle dry plaster. Shoot it through a hose to a nozzle where it will mix with water coming to the nozzle through a separate hose, the volume of water to be controlled at the nozzle with water pressure greater than the air pressure carrying the plaster, and have them mix partly in the nozzle and finish up in the air and on the wall. I have an idea for a nozzle, and it's up to you to build a machine to feed plaster evenly." In less than two weeks or, to be exact, on June 24th, 1907, the "cement-gun" was put in operation and worked about an hour before it broke down, but this was long enough to prove that the theory of hydrating plastic material in transit was practical, and resulting from this were basic patents which have never been successfully contested. We then built another machine of heavier construction which at that time we called the "plastering machine," and proceeded to coat the entire exterior of the Field Museum with from one quarter inch to two inches of plaster of Paris or gypsum.

Every man, or at least every man who has some boy in him, has a hero. Akeley's hero was Theodore Roosevelt. Their acquaintance began after Akeley returned from Africa in 1906 where he collected the elephants now in the Field Museum of Natural History. A correspondence sprung up resulting in Roosevelt's trip to Africa in 1909, in which Akeley took part. Akeley often spoke of Roosevelt's absolute fearlessness. One day while trailing elephants, they were in the midst of a small herd when, from behind an ant-hill, they saw a fine specimen. The elephant got their wind at the same moment and began to advance with trunk outstretched and ears outstanding. Instead of shooting from cover, Roosevelt stepped out, advancing toward the giant as the elephant came on. Akeley said that it seemed to him that Roosevelt never would shoot, but he finally did. This elephant is now one of the elephant group in the American Museum of Natural History in New York City, which will eventually be the center attraction of the Roosevelt-African Hall.

Akeley was unsuccessful in securing the big bull elephant that he wanted for this group before Roosevelt left that territory, and T. R. wrote Akeley from Nairobi on December 17th, 1909, in his scribbly hand-writing, urging him to be sure to get some smaller bulls should he fail to get any big fellows.

Roosevelt's writing was something like Akeley's own, which often I had difficulty in deciphering when he wrote me from the field.

Roosevelt's death was a staggering blow to Akeley, and his crowning ambition was to construct a memorial to Roosevelt, and to this end he designed the Lion Memorial which, in the mind of many of Roosevelt's admirers, was most appropriate. But Akeley, in spite of his many capabilities, was no politician, so his models stand today unused, yet a monument of a worshipper to his hero.

Akeley's bronze, "The Chrysalis," depicting a strong young man emerging from the shed skin of a gorilla, raised a storm of protest from Tennessee-minded people and lead many to believe that he was not a believer in the Creator. He and I have discussed this many times and I know that his belief in God was much stronger than was that of many of his critics. He had no fear of the future, and lived decently in this life merely for the sake of being decent and not for any reward that he expected hereafter. Akeley lived and died a great man, friend of many, hero to at least one.

HINTS AND HELPS FOR HOME and GARDEN

DECEMBER

by
Thomas Sheward

Protect window plants where there is danger of freezing by placing sheets of newspaper over them, or remove from close proximity to the glass.

Bulbs that were potted in September, for forcing in the house during the winter, and placed in the cellar or other dark place to make roots, should be examined, and those which have started to grow can now be taken into the living rooms, for flowering. Roman hyacinths, paper white narcissi, crocuses, snowdrops and freesias will be the first to flower. Freesias planted early in September will flower early in January. Bulbs can still be planted, but will flower later. In many parts of the West and South crocuses and snowdrops will be showing through the ground. A few clumps of these lifted, and planted in pots, will flower at Christmas.

* * *

Dormant roots of *Funkia alba-marginata*, lifted and potted this month, will soon come into leaf when taken indoors and make a fine pot plant for the living room.

Hardy ferns can also be lifted and potted for house-plants during the winter, where they can be collected. There is a species of arum which flowers without soil or water, called "Monarch of the East" or "Resurrection Plant," sometimes offered in bulb catalogs, which is very interesting to grow indoors during the winter. There is one large flower, covered with black spots, which grows before the foliage appears. After flowering it can be planted out in the garden. The Jerusalem cherry requires plenty of water now, or the berries soon dry up.

A few clumps of rhubarb taken into the cellar now, and planted in boxes of soil, will produce stalks for cooking in January, if kept well watered.

* * *

It is a good plan to grow a pot of water cress indoors during the winter, as green feed for the canary or other cage birds. If this is grown in a saucer of water, there will be plenty of young leaves for cutting until next May or June.

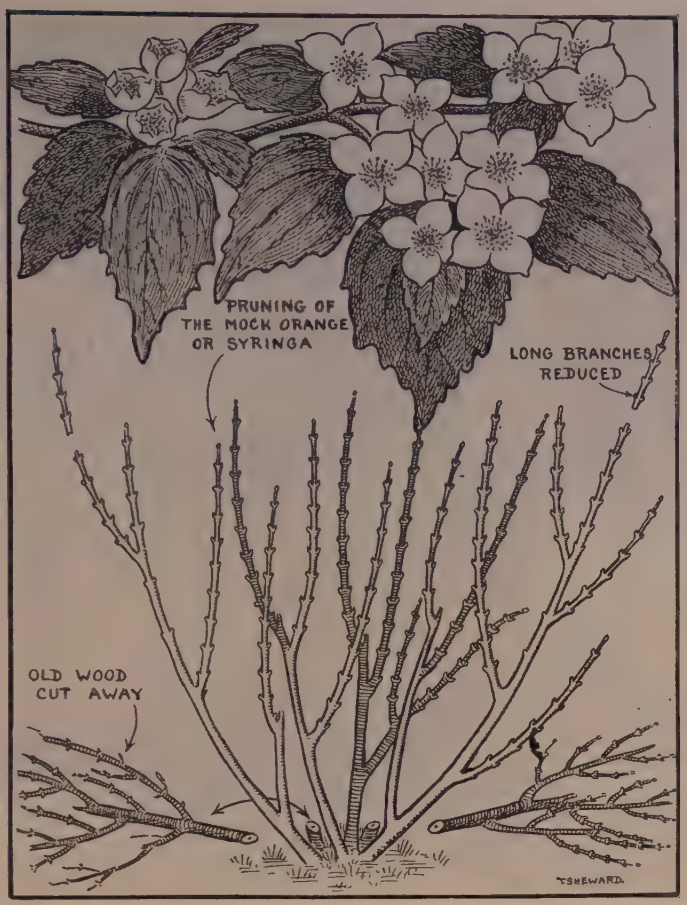
The amaryllis is a good plant for flowering indoors during the winter. There are several species which are

easily grown in the window garden but to get best results with these plants they must not be repotted too often. They flower best when the pot is full of roots.

* * *

If snow accumulates on bushes or small trees, it should be shaken off before the branches get broken. It is a good time now to repair broken tools, paint garden frames, make bird boxes, and to get everything ready for spring work.

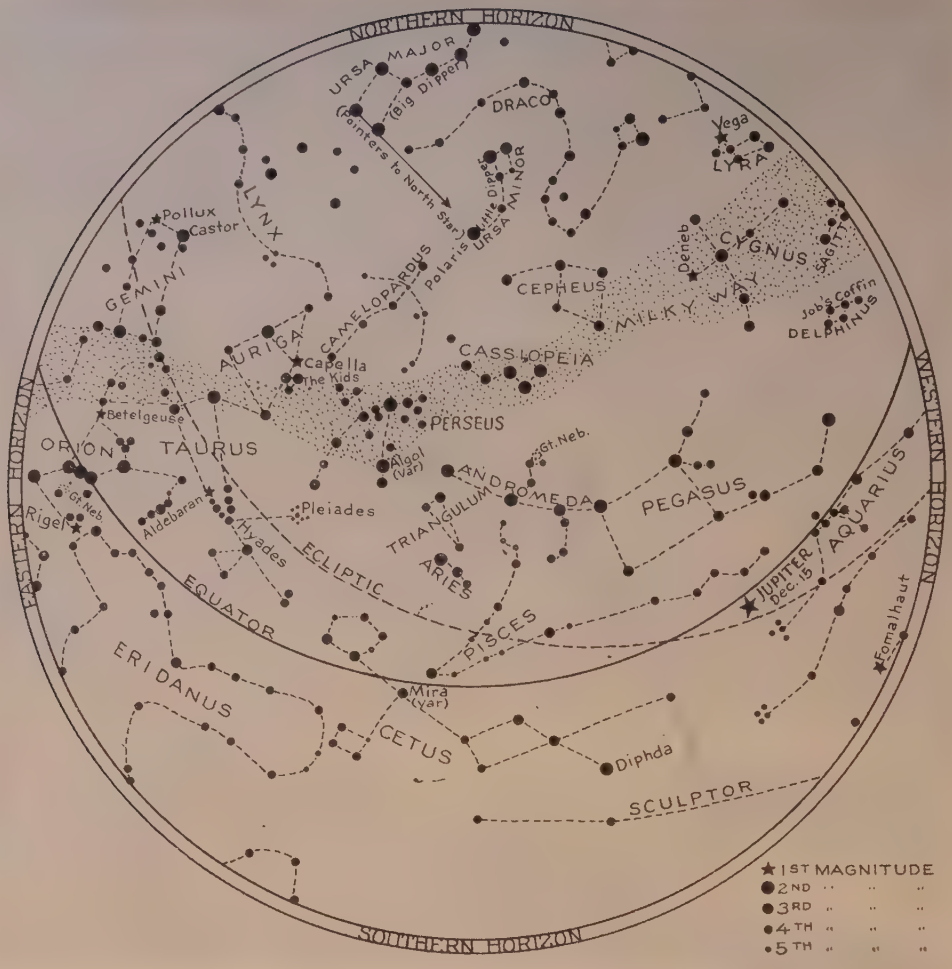
Roses, grape vines, raspberries, and blackberries, in the colder sections of the country, where protection is necessary, should be laid down and covered with leaves and manure. In the South, and West, where the winters are not severe, pruning can safely be practiced.



Many shrubs that flower on the new wood are pruned by renewal. This consists of cutting out old wood, and gradually replacing it with new. Such things as spireas, deutzias, syringa or mock orange, and weigela are pruned by renewal. Buddleia or butterfly bush, is cut back to within eighteen inches of the ground, and *Hydrangea paniculata* should have the new wood reduced to half its length.

If you wish to attract birds to your garden in Winter, place food shelters now, and stock them with corn, suet, crumbs, and sunflower seeds, early this month. You can make these or purchase from one of the makers who advertise in this magazine. Many rare birds will come to feed during the Winter.

FREESIA BULBS CAN STILL BE PLANTED
SNOWDROPS CAN BE LIFTED AND PLANTED IN POTS, FOR FLOWERING IN THE WINDOW-GARDEN
MONARCH OF THE EAST
FUNKIA ALBO-MARGINATA.
T.SHEWARD.



TO USE HOLD OVER THE HEAD WITH TOP TOWARD THE NORTH

This map is for Dec. 1, 9 p. m.; Dec. 15, 8 p. m.; Dec. 31, 7 p. m.

ARIES AND DECEMBER'S SKIES

by Isabel M. Lewis

ARIES, in the legends of the stars, represents the ram with the golden fleece which was sought for by the Argonautic expedition. The two children of Athamas, a king of Thessaly, Phrixus and Helle by name, aided by Mercury, escaped from the wrath of their step-mother on the back of a ram, crossing in their flight the strait that divides Europe from Asia. The girl, Helle, becoming frightened, lost her hold and fell into the sea, which thereafter was known as the Hellespont, or Sea of Helle. Phrixus, continuing his flight, came to Colchis on the shores of the Black Sea. In return for the kindness shown to him by the king of this land he sacrificed the ram and presented him with its golden fleece. It was then hung in the sacred grove of Aries and was guarded by a sleepless dragon.

In ancient times Aries was the first of the zodiacal constellations counting from the vernal equinox, also called the "First of Aries", which was then in the constellation of Aries. Now, however, as will be seen from reference to our star-map, the vernal equinox, or point where the ecliptic crosses the celestial equator, is in the constellation of Pisces, next to Aries on the west. This comes from what is known as the "Precession of the Equinoxes" or gradual shift to the westward of the two points in which the ecliptic intersects the equator. This takes place at the rate of about thirty degrees in two thousand years or a complete circuit of the zodiacal constellations in about twenty-six thousand years. So now, at the beginning of spring, when the sun is at the vernal equinox it is in the constellation of Pisces and not in Aries as it was two thousand years ago and this constellation has lost its former prestige as the first of the zodiacal constellations.

Aries contains no stars of the first magnitude. Its brightest star, Hamal, which is Arabic for The Sheep, is a star of the second magnitude, and the other two stars that form with Hamal the small triangle that is characteristic of this constellation are of the third and

Now everyone can afford to own the COMPLETE works of America's greatest writer of Short Stories

When the Rattlesnake Struck

Judge, when you sent me up for four years you called me a rattlesnake. Maybe I am one—anyhow you hear me rattling now. One year after I got to the pen my daughter died of—well, they said it was disgrace and poverty together. You've got a daughter, Judge, and I'm going to make you know how it feels to lose one. I am free now, and I guess I've turned rattlesnake all right. Look out when I strike.

Yours, respectfully,
RATTLESNAKE.

That is the beginning of one of the stories by O. Henry.

273 Stories—every one the master ever wrote now in a single volume.

O. HENRY

COMPLETE IN ONE VOLUME

$2.98

THE cold frost-bitten street with one solitary street light peering blinkingly into the surrounding black; a molten ugust night with the heat arising in shim-ering waves from stifling pavements; cham-agne corks popping in the Fifth Avenue lo el, beer in a bucket from a cheap barrel ouse, ragged cotton stockings and long slopes f silkclad legs—such are the fragments from hich O. Henry wrought his immortal tales.

All Angles of Life

The sophisticated and the naive; the ballet ancer and the mountebank; the Wall Street roker and the chiropodist; the preacher and he confidence man—each furnish him with theme that will stir your heart and quicken our pulse. Up to this time it has been ossible to obtain all these glorious tales of O. Henry only in the complete set of eighteen olumes—a large and expensive set. These egular-sized sets cost many times the price f this one volume in which every story O. Henry wrote is collected.

Tragically sad, are these tales of O. Henry hat start tears to your eyes, wrench and tug t your heart with their pathos. Drear little ales of New York's drab little shop girls—imp fragments moulded by a careless Potter —who long for fine clothes, beautiful jewels —and a little romance. All their longings, he innermost secrets of their lives, O. Henry nderstood well. He probes deep into the earts of humans and lays them bare for you o see. Sometimes as you read him you lmost wish he did not know so well for the eartache he gives you. But then his gifted en will turn of a sudden and write of a limpse of happiness, a brief swirl of joy that ightens your heart like a gay lilting song.

The World Is His Playground

His stories of New York (he called it Bagdad-on-the-Subway); his stories of the hot banana republics of Central America; his stories of the great West as it was; his stories of weird and odd characters—Jeff Peters, con man par excellence; Fuzzy, dilapidated gentleman; pathetic little Mazie, and a host of others that wander through his crowded pages—all prove the world was a playground for his fertile mind. Each story is a minor epic in itself; every single one has a deft touch that only O. Henry is able to put in. Dramatic and tense situations become laughable comedies; soul-tearing tragedy is turned abruptly into the comic; laughter and tears blend with a harmonious whole that absorbs your entire interest and attention.

All His Superb Tales

And now these stories—over 270 of them, every one the master ever wrote—have been collected into one volume of nearly 1400 pages, printed on the new thin, opaque paper, beautifully bound in cloth; although the type used is larger than ordinary newspaper type, the volume is only 1½ inches thick! And the price is only $2.98.

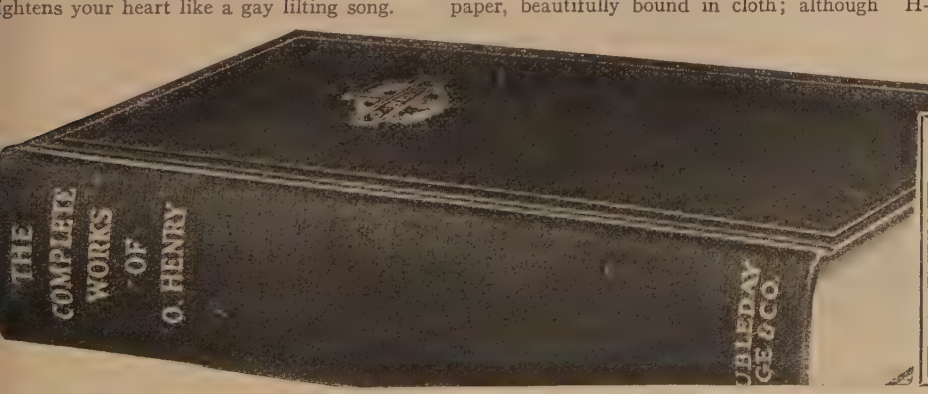
Surely O. Henry captured the very essence of human nature as no one has ever done before or since. He takes the little things—a frayed shoestring; a forlorn rag-doll lying torn and dirty in an ash can; a clubman; a beggar—and each yields to him a story that will give you unending entertainment.

You will *never* tire of O. Henry. Every time you re-read a story of his you will find something more in it; something that shows how well he understood men and women, how close he was to the great throbbing heart of humanity.

SEND NO MONEY

Examine Free for 7 Days

Now for the first time you can enjoy *all* of O. Henry. For all the stories—EVERY SINGLE ONE—have been gathered into one large beautiful volume. You will pick up this splendid book evening after evening, for months, sure of royal entertainment every time. Remember, here is every word O. Henry ever wrote—the "complete works" that fill eighteen regular-sized volumes in the standard edition, costing several times the price of this volume—yours for only $2.98, plus a few cents postage. Send no money. Just pay the postman who delivers the book. Keep and read the stories for a week, then if you can bring yourself to part with the volume return it and you will receive your money back. Act today, for the response to this announcement, from the thousands of O. Henry lovers, will surely exhaust the present edition, and quickly! Nelson Doubleday, Inc., Dept. H-5912, Garden City, N. Y.



NELSON DOUBLEDAY, Inc., Dept. H-5912, Garden City, New York.

Please send me the complete works of O. Henry, containing 273 stories, in one volume, bound in rich Bagdad red cloth. I will pay the postman $2.98 plus carrying charges. You are to return my money at once if I return the book within a week after its receipt. *(Outside U. S., $3.48; cash with order.)*

Name.....

Address.....

City.....State.....

☐ If you want the handsome fabrikoid binding, stamped in gold, check here and pay the postman $3.95 cash plus postage. *(Outside U. S., $4.98; cash with order.)*

posed largely of dense vapors of many gases which must be to a considerable extent dependent upon internal heat for their production since the planet is at such a great distance from the sun that they could hardly be produced by heat given off by our friend, the sun.

OUR CONSTELLATION FOR DECEMBER

It is possible to see the Great Red Spot of Jupiter and its belts and many other interesting features even with very moderate-sized telescopes and all who have access to small telescopes should not miss the opportunity to examine the surface of this huge planet this month while it is still in fine position for observation.

Venus is still a fine morning star, slowly drawing in toward the sun. Saturn will not be visible throughout the month as it comes into conjunction with the sun on December 3. Mars is now in the morning sky, in Libra and Scorpio this month, but it is still too faint and too low in the sky to be seen to advantage. Mercury is not in a good position for observation this month as it is drawing in toward the sun. Jupiter, alone, of all the planets is in the evening sky and it is the brightest object above the horizon.

Winter commences on December 22 at 3:18 P. M., E. S. T., when the sun reaches its farthest point south of the equator and is vertically overhead at all points on the Tropic of Capricorn. This is the shortest day of the year in the Northern Hemisphere and, of course, the longest day of the year in the Southern Hemisphere.

There are two eclipses this month, a total eclipse of the moon on December 8 and a partial eclipse of the sun on December 24, but neither one will be visible in the United States, unfortunately for we who enjoy the eclipses.

The Object Lesson

by G. L. Smith

ducks that dogs had killed. For each he had erected a small headstone and on a larger headstone was inscribed the date and cause of each death. It proved a most effective and successful way of calling attention to the disregard of the park rule against dogs not on leash. It also made many friends for the ducks.

FREE 10 DAYS TRIAL

THE NEW IMPROVED **INKOGRAPH** "PENCIL POINTED PEN" **$1.50**

The Perfect Writing Instrument

GREATEST VALUE EVER OFFERED

NEVER before has any manufacturer of a standard writing instrument which is guaranteed to give perfect satisfaction, offered you so great a value. Remember, the Inkograph answers the purpose of both pen and pencil combined. Its point is shaped like a fine lead pencil point and writes with ink free and easy without a miss, skip or blur. The steady uniform flow of ink actually improves your handwriting. Won't blot, scratch, leak or soil hands.

You who already possess a standard fountain pen will find the Inkograph a most valuable addition to your writing equipment, for it will do everything any fountain pen can do and many very important things which it is impossible to accomplish with any fountain pen at any price.

Combines the Best Features

of both pen and pencil, minus the weak points of both, plus improvements not found in either.

The lead pencil smudges, the point breaks and its writing soon is obliterated. Most fountain pens skip, scratch, flood, clog, leak, blot, soil hands and clothing. The old stylographic ink pencil dries up, balks, blots, writes heavy, flows unevenly and is never reliable. The Inkograph feeds as fast and uniform on the 20th page as it did on the first

Cannot Leak

Not the tiniest drop of ink will spill, although one filling is sufficient to write thousands of words. Will write on any quality of paper.

Makes 3 to 4 Carbon Copies

at one time with original in ink. Bear down as hard as you like without fear of bending, spreading, injuring or distorting the 14 Kt. solid gold point. Are you a salesman?—use an Inkograph, make out your orders in ink and retain a duplicate for your records. Do you wish to keep a copy of your private correspondence? — use an Inkograph. Do you do office work which requires clear carbon copies?—use an Inkograph. Do you make out bills or sales slips?—use an Inkograph and make a permanent original in ink with carbon copies. You can permit any one to write with your Inkograph, for no style of writing can affect the Inkograph point as it will a fountain pen.

Draws Lines to a Ruler

Without smearing, smudging or blurring the paper. Writes with any color of ink.

Requires No Blotter

The ink dries as fast as you write, because the flow is fine, even and uniform.

Patent Automatic Feed

Prevents clogging. No complicated mechanism to clean or get out of order. A year's guarantee certificate with full directions accompanies each Inkograph and is your absolute protection.

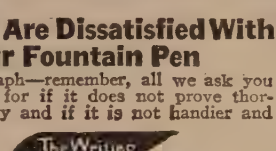
An Instrument of Refinement

In appearance, quality, workmanship and material it is the equal of writing instruments which sell for a great deal more. It's beautifully highly polished finest quality of black, hard rubber, it's 14 Kt. solid gold point and feed, safety screw cap, self-filling lever and clip make it an instrument of distinctive elegance and refinement. Each Inkograph is designed and finished to please the eye and fit the hand of all.

You Who Are Dissatisfied With Your Fountain Pen

Try the Inkograph—remember, all we ask you to do is try it, for if it does not prove thoroughly satisfactory and if it is not handier and does not write smoother and is not far superior to any fountain pen you ever owned, whether it cost $5, $6, $7 or $8, return the Inkograph to us and we'll refund your money—no questions asked.

Inkograph Co., Inc.
199-319 CENTRE ST.
NEW YORK, N. Y.



That hard smooth round ball-like point, which glides with ease over the coarsest paper and makes possible writing in ink as rapidly as with the softest lead pencil.

SAME SIZE AS $7 & $8.75 FOUNTAIN PENS

DEALERS

Stationery Stores, Drug Stores, Department Stores, etc., send for our catalog and trade prices.

$1000 REWARD

Received my Inkograph. Am surprised to know how well I can write with it. The Inkograph is a wonderful little writer, it's my friend now for good penmanship. I am writing this letter with it; can you tell the difference between Inkograph and pen letters? I Can is my answer. C. R. Fuller, Patterson, Mo.

I received my Inkograph with which I am writing this letter. I have purchased at least one dozen ink pencils. Yours seems to be the only one that gives perfect satisfaction. I believe you have solved the problem of the perfect writing instrument. Dr. Richard T. McLaury, Dunkirk, Ind.

The Inkograph is truly the best pen I ever had the pleasure to use barring no price or make of pen, after I take into consideration the high price I usually paid for a Parker, or a Waterman pen, I cannot see how such a low priced pen as the Inkograph can be put on the market and give such unusual service. Harvey L. Winston, Brentwood, Calif.

In making out local requisitions, it is necessary to make an original and two carbon copies on very heavy paper, and the Inkograph does this twice as well as the hardest indelible pencil, and is much neater and the original is much more legible. Wm. L. Fortney, Placerville, Ia.

Your Inkograph is everything you state. It is just wonderful. So send me two more. Arthur Ollcott, Tucker, La.

Gave pen thorough tryout. Enclosed find sample of work I have to perform. Have been using pencil. Never got entire satisfaction. Hard pencil makes original too pale and soft pencil makes poor copy. I am highly pleased. S. M. Cooper, Inquiry Division, P. O., South Bend, Ind.

I found the Inkograph all you represent it to be and I was very well satisfied with it. I made a great mistake when I bought the Inkograph, as I did not take out Loss or Theft Insurance on the pen, for the pen is gone. I am writing this to ask that you send me another Inkograph by return mail, charges C.O.D. I can recommend the Inkograph very highly to anyone who needs a pen which will stand up under very hard usage. George B. Moore, Columbia, Fla.

It sure has improved my hand writing—I never took home any medals for penmanship but I can almost read my own writing since I got this pen. M. F. Johnson, Medina, Wis.

I want to thank you for the return of my Inkograph pen, which you repaired for me. I feel rather lost without this pen in my pocket. I prefer it to any pen I ever carried principally because of the ease with which one can write with it, not having to be careful whether you slide the pen to the North, East, South or West, it flows freely in all directions. Wm. B. Brown, New York, N. Y.

Received my Inkograph and same is filling a long-felt want. Kindly send two more of the same style by parcel post collect as soon as possible. Theodore Priestley, Akron, Ohio.

I bought one of your pens a year ago. You sure build the best pen on the market to my notion. Frank R. Ellsworth, Fargo, N. D.

I wouldn't take $5.00 for the pen I am writing this letter with. I have a good fountain pen but don't write any more with it. I am proud of the Inkograph and that I can say this to you and mean every word of it. R. H. Wilson, Beckley, W. Va.

AGENTS

Sell Inkographs, make bigger profits, more sales, without investment. Quicker commissions, popular prices, no competition. Send for an Inkograph or write for special sales plan booklet.

SEND NO MONEY

Your name and address are sufficient. Pay postman $1.50, plus postage on delivery. When remittance accompanies order, Inkograph will be sent postage prepaid. If within ten days the Inkograph does not prove satisfactory return it and we'll refund your money without further correspondence. It is because we are sure the Inkograph will meet your requirements to perfection that makes it possible for us to make you so attractive an offer.

This Coupon Properly Filled Out Is all that's necessary. Send it today and procure one of the New Improved Inkographs on a 10-Day Free Trial, with no strings tied to it. If you prefer smaller size with ring on cap to be carried on watch chain or ladies' soutoir, mark X here ☐

INKOGRAPH CO., Inc., 199-319 Centre St., New York, N. Y.

Gentlemen: You may send me your Inkograph. I will pay postman $1.50, plus postage on delivery.

Name.....

Address.....

City.....State.....

ASSOCIATES

Prof. George R. Green, *President, American Nature Study Society.*

Prof. J. A. Hollinger, *President, National Council of Supervisors of Nature Study and Gardening.*

Mrs. Elizabeth K. Peeples, *of the Washington, D. C., Schools.*

Prof. L. D. Wooster, *Kansas State Teachers College, Hays, Kansas.*

Miss Clelia Paroni, *Supervisor of Nature Study, Berkeley, Calif.*

Dr. Bertha Chapman Cady, *Girl Scouts, Inc.*

DEPARTMENT of NATURE EDUCATION

Dr. E. Laurence Palmer
Cornell University, Director

The Nature Almanac

The Nature Almanac, which is just off the press, brings together between two covers the answers to a majority of the types of questions which have been coming in to the Nature Education Department of Nature Magazine. It is written to help those interested in nature clubs as well as those interested in more formal school procedures in Nature Education. It gives an extensive bibliography of Nature reference books and it is believed gives a more extended survey of the status of Nature Education in the United States than has ever been available in any form before.

Herewith is a summary of the contents of the Nature Almanac. This volume is for sale by the American Nature Association, 1214 Sixteenth Street, N. W., Washington, D. C., for one dollar, a price considerably less than its cost of production.

The book begins with an attempt to define some of the purposes of Nature Education in the broadest possible sense. This analysis of the situation is published in connection with the prize winning cartoon entitled "Land of the Noble Free" and published in Nature Magazine last spring. This is followed by a Nature Calendar section in which particular care was taken to present a sufficient variety of nature interests that the material might be appropriate throughout the United States.

The section dealing with the organizations which have contributed to the success of the nature movement presents accounts of what some forty organizations have done and are doing in this work. Those organizations which are devoted exclusively to nature education are considered first. Later the organizations of a strictly juvenile nature are given space and still later those concerned with particular fields of science. This last is of course concerned with organizations of people who generally have some particular hobby. The other organizations whose accounts appear are those in which nature education is not necessarily a sole function. In this are included the government departments interested in this type of work, the museums and organizations of the club type. Here in a short space one may find crystallized the professed aims of these organizations which have helped make the nature movement the success that it is.

There may be those who have wondered just what success the work has the right to claim. For those who feel this way the "Nature Education Survey of the United States" will be found useful. Here each state of the Union is given separate treatment. Where possible these accounts deal with the attitude of the state departments of education towards nature work and an analysis of the state's program if it has a program. This is followed by notes on what the institutions of learning are doing to help in the program. The universities and colleges are given first and these are followed by the normal schools and teachers' colleges. Still later in the write-up of each state appears notes on particular communities in that state. These notes are gleaned from cards sent to every city superintendent of schools in the country. Every attempt was made to be impartial in presenting the situations in various parts of the country and for the most part no personal comment whatever is given in the survey.

A section dealing with leadership training shows in detail what is being done by various training institutions. This gives a view of nature guiding in the east, in the west, and in the middle west. It gives a picture of the content and aim of the courses in nature work as they appear in normal schools and teachers' colleges and it gives a brief abstract of a survey sent to nature leaders by the Coordinating Council of Nature Activities.

It is hoped that the section dealing with a School Nature Outline will be useful in assisting those who are working on nature courses for various communities. The field covered is sufficiently comprehensive to permit selection of material appropriate for any community in the United States or Canada. Suggestive material for each of the first six grades of elementary schools is given in such a manner that this material may be presented conveniently either by a teacher of a rural school or by a teacher in a strictly graded school. The topics are grouped on a somewhat utilitarian basis so that the program provides a background of possible value vocationally. Repeated suggestions are made which will be of value in tying the Nature work with the usually standard subjects in the elementary schools. Because it is believed that Nature Magazine is the most universally available source of reference material along nature lines, references are made to the Magazine so that those who wish may enrich the program which is offered by the immediate environment through reference to the magazine. This section offers a ready index to the back numbers of the magazine conveniently grouped.

NATURE NEWS AND VIEWS

Who Wants Cartoons?

Nature Magazine has received several inquiries as to whether some of the striking cartoons submitted in the recent Outdoor Good Manners Contest are available in large size for posting and other educational use. These could be brought out in larger size for this purpose and made available at a small cost if there existed among our members and readers a sufficient demand for them. If any of our readers are interested in such a project we would appreciate their views and suggestions.

Material On Clouds

Some confusion seems to exist in the minds of some of our readers as to the cloud material available from the government. There are two items of interest. One is a pamphlet giving cloud classifications which sells for 25 cents and should be ordered from the Superintendent of Documents, Government Printing Office, Washington, D. C. The other is a chart of cloud forms sold for five cents by the United States Weather Bureau but sent to teachers and principals on request.

Steel Trap Banned

In connection with our article in this issue stressing the need of protection of our fur animals we would again call the attention of all our readers to the efforts of an organization devoted to the abolishment, as far as possible and practicable, of the sufferings of the millions of animals now taken in steel traps. We refer to the Anti-Steel Trap League. Under the presidency of Edward Breck, and with offices at 926 15th Street, Washington, D. C., this organization has drawn together many eminent people, including several women interested in humanitarian and conservation work. It is the belief of many who are in a position to know that the use of this atrocious engine of suffering is declining.

In this connection it is interesting to note that South Carolina has spread upon its statute books a law forbidding the use of the steel trap in a commercial way within its borders. It is the conviction of many that this marks the beginning of a better and more widespread appreciation of the rights and the esthetic appeal of our mammals, long the victims of unthink-

Filmo REGISTERED
BELL & HOWELL

MOVIES

—the gift that brings *all nature* to a *Nature Lover*

THERE is someone near and dear to you who would appreciate such a gift as this. Someone who seeks to understand, with you, the beauties of a flower, the urge that sends the wild geese honking Southward, the solitudes that house a million lives. This is the camera that captures it all and gives you, in motion pictures, a source of everlasting pleasure.

It is Filmo, the personal motion picture camera made by "*the movie people.*" Bell & Howell cameras are used almost exclusively in making the featured movies shown at best theatres everywhere. The precision necessary in making a theatre movie is also found in Filmo, for making better movies *of your own.*

Filmo is *so* easy to operate. Two simple operations—look through the spy-glass viewfinder and press the button. That is all. "What you see, you get." Easier than taking snapshots. With Filmo you can use any one of fourteen lenses for special conditions. One lens is so fast it takes clear pictures after the sun is down. Another takes close-ups of distant animals and birds—or magnifies a bee in a flower to fill the whole picture. And so on, for every purpose.

Eastman Safety Film [16mm.] in the yellow box, used in Filmo camera, is obtained at practically all stores handling cameras and supplies. First cost includes developing and return postage to your door. Then Filmo Projector brings your pictures back—in brilliant, beautiful movies, on a wall or screen in your home or anywhere.

There is also Eyemo—a standard 35mm. camera for those who wish to commercialize their products.

A Filmo dealer near you is ready to show and demonstrate this wonderful gift. Write us for the fully descriptive booklet, "Filmo—Home Movies of the Better Kind."

BELL & HOWELL CO.
1800 Larchmont Avenue Chicago, Illinois
New York, Hollywood, London [B & H Co., Ltd.]
Established 1907

Opto Kit $6.00

A useful, entertaining, instructive Christmas gift

50 Power Microscope to reveal the life and mysteries of objects invisible to the unaided eye.
Six Power Pocket Telescope to observe distant objects with ease and clearness.
Reliable Compass to guide you on land and sea.
Pocket Magnifier that has a dozen uses.

At your dealer, or direct, postpaid, $6.00

Wollensak Optical Co.
976 Hudson Ave. Rochester, N. Y.

This 5 POWER "Scout" Monocular A Practical Gift

An S. & A. Importation

A Christmas gift for a real boy—he'll get endless enjoyment out of this five power prism monocular used by scouts, rangers and hunters.

$5.00 At your dealer or sent direct postpaid.

Tells Weather Changes in Advance

S. & A. BAROMETER

A handsome brass and mahogany finish instrument—accurately foretells the weather—necessary in planning outdoor sports, hunting, motor trips, etc.

$3.00 At dealers or sent direct postpaid.

German Field Glasses

8 POWER

See 10 to 20 miles on a clear day. Day and night lenses—the all-around sports glass. Cash refund if not satisfactory.

$9.85 At dealers or sent postpaid.

Dealers:—Send for Silent Salesman Display Cards
Our expert repair department will gladly submit estimates on all glasses sent in for repairs

SWIFT & ANDERSON, Inc.
Largest Importers of Field Glasses in America
97 W. Federal St., Boston, Mass. 23 M. Scott St., Toronto, Can.
Sole Distributors for HENSOLDT DIALYT PRISM BINOCULARS. *Send for Catalog.*

OWN A BAROMETER—and Foretell the Weather

This reliable Barometer enables you to predict accurately any change in weather 8 to 24 hours in advance. Scientifically constructed, attractive in appearance. Highly polished mahogany case, silvered metal dial heavy bevel glass front. Size 5½ inches.

An Ideal Gift

Makes a highly prized and lasting gift. Educational, useful and interesting. Indispensable to motorists. Should be in every home. Fully guaranteed; postpaid to any address on receipt of **$5.00**

DAVID WHITE, Dept. 22, 419 E. Water Street
We repair all makes of barometers
Milwaukee, Wisconsin

ing commercial exploitation. It is to be hoped that this law, which bars the steel trap except where set within close proximity to a house or poultry yard as a means of protection against marauders, will serve to alleviate some of the suffering that this form of trapping causes.

Mr. Cleaves Lectures

Having returned recently from Labrador, Howard H. Cleaves has perfected an interesting illustrated lecture under the title of "Cruising Audubon's Labrador." His trip carried him over territory covered by John James Audubon, who made bird studies with his pen and brush. Mr. Cleaves has made similar studies with motion picture negative and is able to bring back the living and moving testimony of his trip. He will make use of this material in his lecture work this season.

Fuertes Memorial

There is no need to expand upon the great contributions to ornithology made by the late Louis Agassiz Fuertes of Cornell. All our members, however, will be interested to know that there is a movement on foot to set up a memorial to the man and his achievements, a green and beautiful memorial, throbbing with the bird life that he knew, loved and painted so well. Further, this memorial would be a sanctuary where these birds will find refuge and safety. The sanctuary would be at the head of Lake Cayuga, directly in the path of the flight lanes of wild ducks. On the proposed tract is an old boat house, ideally suited for use as a museum and a post for bird observation. The location would be further developed to attract the birds. It is a movement that merits and will receive nation-wide support.

Waterfowl Census

Enthusiastic cooperation and fine results are reported by Dr. Harry C. Oberholser of the United States Biological Survey in connection with the monthly waterfowl census being carried on throughout the country in order to obtain estimates of the relative numbers of these birds and their movements. Paul G. Redington, Chief of the Biological Survey, states that game conservation organizations and sportsmen's clubs are cooperating cordially. In connection with the work the colored pictures of twelve ducks used in the November issue of NATURE MAGAZINE are serving widely in identifying the birds.

SPECIAL—Holiday Sale!

MIRAKEL

VEST POCKET BINOCULARS

5-POWER · $19.85

(7-POWER : $35)

USED BY—Frank Chapman, R. Bruce Horsfall, Arthur Newton Pack, Ernest Thompson Seton, Vilhjalmur Stefansson, etc.

Seeing is Believing

MIRAKEL DISTRIBUTORS
1214 16th St. Washington, D. C.

The Colonial Sun Dial

with its motto—"*Time takes all but memories*" makes the ideal Christmas or anniversary gift. Made of cast metal; diam. 11"; weight 9 lbs. Lacquered a rustic gray and gold. **Postpaid,** $3.50, or $4. west of Denver.

A. H. PATCH, INC. Craft Dept.
Clarksville, Tenn. Est. 1885

Make your own Christmas gifts. Write for prices and illustrations of our line of undecorated and hand painted castings—book ends, door stops, lamps, novelties, etc.

A BALSAM PILLOW
from the Adirondack Mountains
makes a most delightful gift. We crowd the fragrance of the forest into a beautiful green, rose or blue silk, hand-painted cover

1 lb. 8 inches square size is $1.00
2 lb. 11 inches square size is $2.00

Postage prepaid within the third zone include additional for points beyond. No C. O. D. order accepted

CAMP PAYNE
Box 173 Inlet, New York

Trees for the Mines

It is interesting to note a paragraph in a recent copy of the digest sent out by the Anthracite Coal Operators in comment on the change in policy of the State of Pennsylvania in distributing its nursery trees. The State has ceased giving seedlings away except to schools and will, in the future, sell them at low cost prices. The note points out that mine companies have been particularly active in reforestation, finding that it was economical to produce mine props on their own lands. Full details are given to the operators as to how to obtain trees under the new regulation.

LUMBERING up the HOUSE

NOWADAYS people often lumber up their houses with woodenware without realizing that they are doing so.

Here we see a young couple surrounded by articles of daily use acquired in a department store. The number of these things that are made of wood, either wholly or in part, is much greater than you probably suppose.

John holds a phonograph record in his hand. He knows the selection is "The Parade of the Wooden Soldiers," but he does not, we believe, suspect that the composition from which such disks are moulded contains from sixty to eighty per cent wood "flour"—one of the novelties among forest products.

Mary is admiring a pair of stockings made of what we

COURTESY WOODWARD AND LATHROP

EVERYTHING IS MADE OF WOOD

The furnishings and other objects in the picture can trace their ancestry to the forest

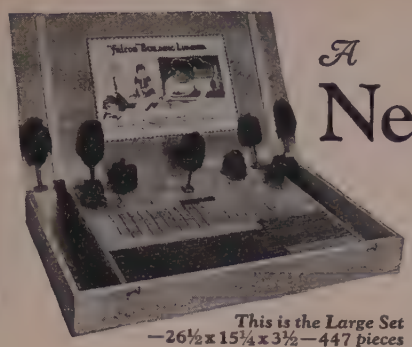
used to call "artificial silk," before the name "rayon" was invented. She probably knows that this "silk" was not made by a silk-worm, but would be surprised, perhaps, to learn that it may have grown on a spruce tree. Mary's sweater is made of the same ultra-modern textile as the stockings, and so is the drapery on the wall.

Wood pulp was evolved by a variety of manufacturing processes into the books on the table and the newspapers on the chair; the wrapping paper and twine; the fibre rug on the floor; the "board" with which the room is paneled and from which the scrap-basket was made; and, last but not least, the furniture—apparently made of reed, but actually of wood-pulp fibre, moulded around a core of wire.

Incidentally, the forest provided wood alcohol and turpentine for the paints and varnishes with which some of the above-mentioned articles are coated, and bark for tanning John's shoes.

Wilmington Again

Under the able supervision of Violet L. Findlay, the Nature Study department of the Wilmington, Delaware, schools has been notably successful. The department is now sponsoring a new little Nature Study bulletin in mimeographed form. It has the title, "Have You Seen It?" and is being brought out on the theory that many people miss things of interest in the out-of-doors because they do not know where to look for them. It also gives an opportunity to chronicle school news and many of the observations should eventually come from the Nature students, whose interests have been so well stimulated by Miss Findlay's work.



A falcon toys that last

New Toy

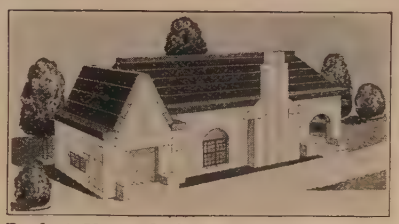
Build Homes, Churches, Hotels, Stores, Theaters, Railroad Stations and all forms of modern Building Construction

This is the Large Set —26½ x 15¼ x 3½—447 pieces

"Falcon" BUILDING LUMBER

Two of the many types of Houses which can be built with all Falcon Sets—trees and shrubbery included

"Falcon" Building Lumber builds *real* buildings—you don't have to "imagine" anything. This toy building lumber is designed just like real ready-cut building material. Includes everything needed to erect buildings like those shown—doors, windows, chimneys, red roofing boards, device for holding roof in place, trees, shrubs, hedges, even a "building plot." "Architect's Plan Book"—also an entirely new idea—is enclosed with each set and gives full instructions.



Banker's Home—built with Sets Nos. 5 and 10

"Falcon" Building Lumber will delight both boys and girls of any age. Three sizes—$3, $5, $10—and sets are interchangeable for elaborate building such as complete villages and railroad systems.

Falconville Church—built with Set No. 10

"Falcon" Building Lumber is cut on a *multiple unit* basis—and builds complete houses with four sides—packed in a hinged wooden box, mahogany lacquer finished. Many different types can be built with the $3.00 set—with the larger sets there is the widest latitude to the imagination of the "*young designer.*"

Go to your dealer first—if he cannot supply you, send the coupon and we will ship prepaid.

American Mfg. Concern, Dept. M, Falconer, N. Y.

I enclose $.....for Falcon Building Lumber indicated below—money to be refunded if I wish to return the shipment before Xmas.

..... No. 3 Sets at $3. ..... No. 5 Sets at $5. ..... No. 10 Large Set at $10.

Name.....

Address .....

TEN RARE CACTI

Beautiful Specimens

$1.25 only
Express collect

Makes Appropriate Holiday Gifts

Also makes handsome table Gardens. Special Cactus Candy $1.35 pound postpaid. Holiday Edition.

Illustrated catalogue with package of mixed cactus seeds 25c.

DESERT PLANT COMPANY
Station A, Box 95 EL PASO, TEXAS

NEW WATER FERN

Beautiful House Plant --- REQUIRES NO SOIL

THRIVES IN A VASE OF WATER

A peculiar and interesting plant that is admired by everyone; handsome, velvety, fine, fern-like foliage. Curls up and goes to sleep when taken out of water, and keeps in its sleeping or dormant state for weeks and awakens again in a few minutes after being placed in water. Owing to the fact it is capable of sleeping and awakening repeatedly, it is called the Opossum Fern. Do not confuse this plant with the much advertised Resurrection plant.

If you want one of the most satisfactory and beautiful "Table Ferns," something entirely new, get one of these marvels of plant life. Plants, **25c each; 3 for 50c; 7 for $1.00,** postpaid. **BURGESS SEED & PLANT CO., 340 W. F., GALESBURG, MICHIGAN.**

Enjoy Healthier Winter Flowers in this Scientific Box!

Proper Irrigation
Proper Ventilation

The PERFECTO FLOWER BOX embodies correct, approved, scientific principles for raising luxuriant plants and flowers indoors. Patented system with entrance at front end feeds water properly at roots of plant and evaporates at the right soil; keeps it from souring. Makes most beauty in the home and rapid growth of young roots even in winter time. Four sizes finished in old ivory and green. 26 inch size sent prepaid for short time for $2.50. Satisfaction guaranteed or money refunded.

METAL EGG CRATE CO.
365 Wolfe St., Fredericksburg, Va.

DAHLIAS

LOOK FOR THE TRADE MARK WHEN LOOKING FOR QUALITY

For sale instead of a common type. Trade Mark [illegible] quality and [illegible] Strong [illegible] and free [illegible] Catalogue [illegible] Send today. This [illegible] well [illegible] and over 42 years a specialist.

W. W. WILMORE
Box 382
Denver Colorado

The Orchid Gladiolus Bulblets

Large, should bloom first year	50c
Medium, [illegible] first year	30c
Small [illegible]	
12 Beauty Ladies [illegible]	$1.00
7 Royal Ladies [illegible]	$1.00
4 Royal Ladies [illegible]	$1.00
100 Pansy Seedlings [illegible]	$1.00
10 Iris One Varieties, name [illegible]	$1.00

Shiloh Gardens Box 550, Omaha, Neb.

Zoo Director Sought

For the selection of a director for the Milwaukee Zoological Garden, the City Service Commission will shortly hold an examination. Milwaukee has a growing a progressive zoo and the position offers a fine opportunity for one who has chosen this work as a live endeavor. The date of the examination had not finally been decided on at the date of going to press but full details can be obtained by addressing Herbert W. Cornell, City Service Commission, City Hall, Milwaukee, Wisconsin.

An Indian Lecture

Hugh Stevens Bell, an outstanding member of the younger group of naturalist-photographers, has a faculty of unceasing activity. His Nature work has carried him from the backyard to little explored sections of this country, particularly the Southwest. During 1927 he led the southwestern expedition of the Cleveland *Plain Dealer* and lived among the Hopi, Zuni and Navajo Indians. This last summer he spent in the Kaibab. Mr. Bell is now opening his sixth lecture season featuring a lecture entitled "My Indian Friends", with supporting lectures on owls, spiders and wild flowers. The lectures are illustrated from material gathered by Mr. Bell and constitute a fine series. Mr. Bell lives in Willoughby, Ohio, and is known to the readers of Nature Magazine through contributions to its pages.

Have You Any Walnuts?

Mr. N. F. Drake, Fayetteville, Arkansas, has announced a prize contest designed to bring to light good black walnut trees that may be the forbears of nut trees worthy of propagation. Details of the contest, which requires the submission of sample walnuts for rating, may be obtained from Mr. Drake at the address above.

TEN CACTI

Blooming size All different

Postpaid for $2.50

JAMES ALLAN
Mountain Park New Mexico

"Beaver Brand" Hardwood Ashes are Nature's Fertilizer for Garden and Horticulture. Their use will surprise you by the rich color they give to Flowers. **Chas. Stevens, Drawer 30, Napanee, Ont., Can.**

Buy Direct at Dealer Prices

Wire Netting at Wholesale

A big saving on wire netting in all sizes for any type of bird or animal enclosure. Wholesale prices and prompt delivery from our large stocks at Clinton, Mass., Chicago, Seattle and Minneapolis.

Free Catalogue on Crown Pen Materials

Crown Iron Works Co. 1253 Tyler St., N. E. —Minneapolis

Audubon Bird Charts

Twenty-six Common Birds

(In Color)

Drawn by EDWARD KNOBEL
under the direction of RALPH HOFFMANN

The Birds pictured are as follows:

Red-winged Blackbird	Golden-crowned Kinglet
Bluebird	Robin
Bobolink	Chipping Sparrow
Catbird	Song Sparrow
Cedar Bird	Barn Swallow
Chickadee	Chimney Swift
Purple Finch	Scarlet Tanager
Flicker	Wood Thrush
Goldfinch	Red-eyed Vireo
Ruby-throated Humming-Bird	Black and White Warbler
Blue Jay	Yellow Warbler
Kingbird	Downy Woodpecker
Baltimore Oriole	House Wren

Interesting-Instructive

Awaken the interest of children in our common birds with these charts depicting the natural colored, life-sized birds in their characteristic attitudes. They are practical and helpful in all nature study and drawing.

Lithographed and mounted on cloth. Size 27 x 42 inches

For
Home Schoolroom Library

Four Beautiful Charts

Price $2.50 Each

AUDUBON
BIRD CHARTS
1214 Sixteenth Street
Washington, D. C.

Mrs. Ford Elected

At the recent meeting of the Woman's National Farm and Garden Association, Mrs. Henry Ford was elected president, succeeding Marion Roby Case. Both Mr. and Mrs. Ford have been actively interested in the development of vacation gardening among school children all over the country.

Dr. Chapin Returns

Twenty-five hundred specimens of birds and small mammals were brought back from Central Africa by Dr. James P. Chapin, associate curator of birds at the American Museum of Natural History. Accompanied by De Witt L. Sage, the expedition spent eighteen months in the Ruwenzori Mountains and in travelling from Mombassa to Cape Town.

Lectures By Mr. Kern

An interesting group of three lectures has been worked out by O. J. Kern of the University of California at Berkeley. One is devoted to outdoor art for school and home and another to indoor art. The third covers significant contacts with outdoor life. All have their foundation in Nature and the adaptation of it to our modern life.

Mr. Robb's Work

Outstanding contributions to bird knowledge, appreciation and conservation in Canada are being made by Wallace Havelock Robb of Belleville, Ontario. On his recent visit the Prince of Wales took special occasion to meet and talk with Mr. Robb, commending his fine educational work and evincing no small personal interest in ornithology. Beside devoting his time to arousing public interest in bird life, Mr. Robb is known as the Canadian Poet of the Birds. He is bringing out a non-commercial collection of his bird poems in limited edition and under the patronage of the Prince of Wales. Mr. Robb is a member of the American Ornithologists' Union, and the American Nature Association, and is widely known in Canada and the United States for his work in this field.

A Humming Bird's Nest

Miss M. L. Hays of Happy Jack, Louisiana, is anxious to obtain a humming bird's nest, preferably one that is attached to a piece of branch. She would like to get in touch with someone who has one and would like to make an exchange.

THE BIO-SET

Featuring the new Bio-Scope

An Ideal Christmas Gift for the Naturalist!

THIS fascinating biological outfit includes the new and specially designed BIO-SCOPE, magnifying up to 250 diameters, the best microscope of its type now on the market. The set contains in addition 30 different items such as dissecting instruments, permanent microscope slides, blank slides and covers, preserved plant and animal specimens, stains, chemicals, and reagents, together with a copy of "An Introduction to Slide Making," giving full directions for making microscope slides. Supplied complete in a beautifully finished gift box.

At your dealers or direct, prepaid

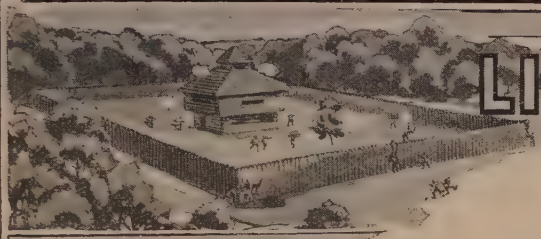
The BIO-SET, complete	$27.50
Set without microscope	10.00
The BIO-SET Jr.—Similar outfit but equipped with the BIO-SCOPE Jr. magnifying 100 diameters, complete	$17.50
Set without microscope	7.75

Enjoy the Sights in the Microscopic World!

NEW YORK BIOLOGICAL SUPPLY CO., Dept. N

The Source for Biological Supplies of the Leading Colleges and High Schools of the Country

34 Union Square New York, N. Y.



LINCOLN LOGS

"Another Redskin Bites the Dust"

The defenders in the Blockhouse behind the rough hewn Logs are the Pioneers whose handiwork is duplicated in miniature by LINCOLN LOGS—"America's National Toy".

"Let's play Indians"—"Let's build a Stockade"—"Let's make a Fort"—"Let's"—but why go on? There's no end to the things which can be made with LINCOLN LOGS—the "All American Toy". The LOGS are made of hardwood cut in multiple units, stained a natural brown. Practically indestructible themselves, they do not hurt fingers or furniture or floors.

Always a Welcome Christmas Gift

"More LINCOLN LOGS" is the most appreciated Christmas Present for the child who already has a set. In addition to Cabins, Forts, Churches, Blockhouses etc., our Design Book shows many examples of elaborate Log Construction, easily built if the child has sufficient LOGS.

ORDER EARLY FROM YOUR DEALER

If you have any difficulty mail us the Coupon

LINCOLN LOGS

Room 56, 232 E. Erie St., Chicago, Ill.

Please mail at once, postage prepaid:

☐ Big Combination Sets, 234 logs, etc., at $4
☐ Triple Sets of 166 Logs at . . $3
☐ Double Sets at $2 ☐ Single Sets at $1

Enclosed is $____ for Logs specified. Money to be refunded if not satisfactory. Send to

Name _____

Street or R. F. D. _____

City _____ *State* _____

Join!
Yesterday-Today-Always
The GREATEST MOTHER

No better gift for Christmas than a

JUNGLEGYM

Can you tell the difference in anatomy between your children and those among the lowlies? These differences are astounding to you and unfundamentally startling. Perhaps you can give your children all the climbing they want and fundamentally should have.

THE JUNGLEGYM

PLAYGROUND EQUIPMENT CO.
5 Irving Terrace Cambridge, Mass.

Please send me your catalog and price list.

Name

Address

City and State

ZULU Games
are Different!

Our Gift plan makes it possible for you to buy direct from the factory

ZULU Games are new and different and are priced from 10c to $1.00 postage extra. Merely send us names ages and addresses of the children you want to receive ZULU Games. We select the games and send them at the price you wish to pay and enclose card for you if desired. Use 1c to 10c stamps insured postage, except the Parlor Game where 46c is needed.

ZULU Games include Educational Card and Board Games, Shooting Games, Bowling Games, Tiddledy Winks Games and Puzzles.

ZULU TOY MFG. CO. Battle Creek, Mich.

For Christmas give

NORTHLAND SKIS

When 90% of the world's best skiers use them, you can't go wrong in making them your choice. Look for the patented trademark. Send for free booklet, "How to Ski".

NORTHLAND SKI MFG. CO.
32 Merriam Park Ave. St. Paul, Minn.

Make Money in Photography!

We train you quickly at home. No experience necessary. Spare time or full time. Photographs in big demand by magazines, newspapers, advertisers, etc. Portrait Photographers make more money today than ever before. Commercial photography also pays big money. Nothing else like it. Write today for details and new FREE book, *Opportunities in Modern Photography*.

American School of Photography
Dept. 1609 3601 Michigan Ave., Chicago, Ill.

A Kentucky Park

An active campaign is now under way in Kentucky to raise two million dollars for the acquisition of some seventy thousand acres in the center of the State to be turned over to the Federal Government as a National Park. This area includes Mammoth Cave and many other interesting caves, as well as much virgin timber and country of great scenic beauty. This proposed park would be one of a trinity with parks in the Shenandoah and Great Smoky Mountains. The work is being carried on by the Mammoth Cave National Park Association with offices in the Martin Brown Building, Louisville, Kentucky.

Dr. Howard Resigns

After more than thirty-three years of service as the chief entomologist of the United States Department of Agriculture, Dr. L. O. Howard, Chief of the Bureau of Entomology, has asked to be relieved of his administrative duties in order that he may devote himself to research. His resignation has been accepted and he will have an opportunity to devote himself to his favorite fields of medical entomology and parasitology. Dr. Howard will be succeeded by Dr. C. L. Marlatt, associate chief.

A half century of service has been given to the Government by Dr. Howard, who recently passed his seventieth birthday. It has been five decades of distinguished service and outstanding accomplishment, winning him honors of international character. He was a leader in the campaign against the mosquito and the crusade against the house fly. He is a member of many scientific societies and was permanent secretary of the American Association for the Advancement of Science for twenty-two years, serving as its president in 1920-21. The bibliography of his publications includes 941 titles. Dr. Howard is a member of the Scientific Consulting Board of NATURE MAGAZINE and will continue to serve on that board.

At Breeze Hill

An interesting work is being carried on by J. Horace McFarland on the grounds of his estate, Breeze Hill, near Harrisburg, Pennsylvania. Loving to live among plant growth, Mr. McFarland has, also, turned his gardens to service as a proving ground. Careful photographic and color records are kept daily during the growing season, and although the area is not large the diversity of the collection is considerable. The gardens are open to all sincere horticulturists except on Sunday afternoons.

They're Different "CHICAGO"
TRADE MARK REG. U.S. PAT. OFF.
Rubber Tire Roller Skates

Whisper in Dad's ear that you want "CHICAGOS" this Christmas because they go faster on their ball-bearings and silent rubber tires; the tires glide over cracks, absorb shocks, prevent slipping, stop with four-wheel brakes, and outwear any steel wheel made.

Tell him all good dealers sell "Chicagos" or they are sent direct for $4.00 and dealer's name.

CHICAGO ROLLER SKATE CO.
Established over 20 Years
4651 W. Lake Street Chicago, Ill.

FREE BOOK
"How To Roller Skate"
Tells how to start and stop correctly, go faster and everything else about roller skating. Also suggestions for games and "hiking." Just write for it.

BUDDY SNOW SKATES

SNOW SKATING is loads of fun for both Girls and Boys and keeps them off dangerous ice ponds.

Buddy Snow Skates are made of hard maple with a wide concave steel runner. So safe that little tots can stand or walk in them—can be worn over rubbers or overshoes—no wet feet. One size fits children from 3 to 13 years old. Corrugated rubber prevents the shoe from slipping—soft pliable rawhide thongs fasten the skate on the foot.

THE WINTER SUBSTITUTE FOR ROLLER SKATES

Most Toy Stores have Falcon Buddy Snow Skates. If you have difficulty in finding them we will see you get them if you Mail the Coupon.

American Mfg. Concern, Falconer, N. Y.
Please send me, postpaid
☐ pair Buddy Snow Skates at $1.75
Enclosed is $_____ for above order, if not satisfactory you are to return the money.
Name_____
Street or R. F. D._____
City_____ State_____

CHRISTMAS GREETINGS

Special Christmas Cards

size 3¼ x 6 inches

made by our own artist

for Nature Magazine Readers

This beautiful card in full colors—Red, Green, Yellow and Black

One dozen 25 cents, 50 for $1.00

Carry the Nature idea in your Christmas Cards

Order at once!

These cards sold only by orders received direct.

NATURE MAGAZINE
1214 Sixteenth Street, Washington, D. C.

Enclosed find $..... for which send me .....Special Christmas Cards.

Name.....

Address.....

City.....*State*.....

See Miles Away!

with Big 3½ Ft. Telescope

5 DAY TRIAL

Brings distant people and objects close to your eyes. New pleasures for home, farm, travel, sport. See Sun, Moon, Stars as never before. P. Brush wrote: "Watched Submarine 3 miles off coast." C. Scribner: "See lighthouse 18 miles away." CLIP THIS AD

Opens out over 3½ ft. 5 Big Sections! Measures 12 closed. Brass bound. Powerful lenses protected by dust caps. 8 Power. Surprise your friends.

FREE Carrying-Case with Strap. with each wonder telescope. Travel and Sport

Send No Money

On delivery of Telescope, Free Case, pay Postman only $1.85 plus postage. (2 outfits $3.50) Or send $1.85 and we pay postage. Try for 5 days at our risk. Satisfaction guaranteed or money refunded. Send today! Study the Heavens

FERRY & CO., Dept. 2010. CHICAGO, U. S. A.

BECOME A LANDSCAPE ARCHITECT

Dignified, exclusive profession. Little competition. $5,000 to $10,000 incomes for experts. Easy to master under our correspondence methods. Assistance extended to students and graduates. Write today for full details.

American Landscape School, 83, Newark, New York

WANT WORK AT HOME?

Earn $18 to $60 a week Retouching photos. Men or women. No selling or canvassing. We teach you, guarantee employment and furnish Working Outfit. Limited offer. Write today.

Artcraft Studios, Dept. C.
3900 Sheridan Road, Chicago

YOU CAN OIL PAINT

Amazing new method teaches men or women to earn after first lesson. OIL PAINT photos at home—portraits, landscapes or art subjects. Many earn $18 to $100 and more a week. OIL PAINT OUTFIT GIVEN at No EXTRA COST. Graduates furnished employment. Send now for free illustrated book.

PICTORIAL ART STUDIOS, INC.
Dept. E. N. 2926 Broadway, Chicago, Ill.

EARN PROMOTION AND COLLEGE CREDIT

through the

HOME-STUDY COURSES

in 40 different subjects given by

The University of Chicago

201 Ellis Hall, University of Chicago, Chicago, Ill.

EARN $25 WEEKLY

spare time, writing short stories and news items for newspapers, magazines. Experience unnecessary. Details FREE.

PRESS SYNDICATE, 1268, ST. LOUIS, MO.

THIS CLASS PIN 30c.

12 or more, Silver plate, Single pins 40c ea. choice 2 colors enamel, 3 letters, date. Sterling Silver, 12 or more 60c ea. Single pins 60c. ea. Free Cat. shows Pins, Rings, Emblems 25c to $8 ea.

685 METAL ARTS CO., Inc., 777 Portland Ave., Rochester, N.Y.

Saves Thousands of Needless Steps!

One Trip! Sets or Clears the Table

Helps at Entertaining! Better than a Maid! Has 100 Other Uses! Speeds & Lightens Housework! Combination Products Co.

* Write for FREE BOOK and all details New! Service Wagon

Dept. N1201, Cunard Bldg., Chicago

Come UP to Asheville!

Where Every Season finds Nature at its best

And autumn or winter in the Carolina Highlands are months of long-to-be-remembered beauty, with cloudless skies and air a-tingle with the clear freshness of high altitudes.

KENILWORTH INN

200 Rooms—All Outside

An ideal stopping place offering every comfort and convenience and a wide variety of sports and entertainment. Located itself a-top a small mountain commanding a gorgeous scenic panorama.

AMERICAN PLAN

Limited Accommodations at Special Weekly Rates

Single Room, hot and cold water.....$42 and up.
Single Room, private bath $56 and up.
Double Room, hot and cold water .....$80 and up.
Double Room, private bath $90 and up.
Double and Single Room, private bath.....$126 and up.

Headquarters for the APPALACHIAN SCENIC HIGHWAY, CAPITOL TOURS and APPALACHIAN TOURS. Touring Maps and detailed Railroad Information gladly forwarded on request.

ROSCOE A. MARVEL, *Manager*
Asheville, North Carolina

Mount Birds

Learn at Home by Mail

Be a taxidermist! Learn to mount BIRDS, ANIMALS, GAME HEADS, FISH. Wonderful fascinating new art. All secrets revealed. Easily, quickly learned by men, women and boys. Decorate home and den with nature's finest art. SPORTSMEN save your trophies. BIG PROFITS for spare time. Sell your mounted specimens and mount for others. Have a business of your own. Big demand, high prices. Learn from old reliable school, 20 years' experience.

FREE! Beautiful illustrated book, "How to Learn to Mount Game", with dozens of photos of mounted specimens. Yours for the asking — FREE — Write Today. Taxidermy is a NECESSITY for sportsmen and nature lovers —INVESTIGATE. Get this wonderful FREE BOOK NOW — no obligations. Write! Don't delay. Send Coupon Today—NOW!

FREE BOOK COUPON

N. W. School of Taxidermy
2949 Elwood Bldg., Omaha, Neb.
Send me your free illustrated book "How to Mount Game." Also tell me how I may learn this fascinating art easily and quickly by mail. No obligation.

Name .....

Address .....

WINGS AND PAWS

By WILLARD ALLEN COLCORD

One Hundred and Fifty Delightful True Stories About Birds, Animals, and Insects

Thrilling *True* Stories entertainingly told, and useful information about Birds, Animals, and Insects, that children will enjoy reading.

The book is divided into four parts, the first dealing with birds; the second with tame animals; the third with wild animals; and the fourth with general information regarding natural history subjects.

Three hundred pages; thirty illustrations; and twenty-eight feature pages. Bound in dark green cloth with illustrated jacket and cover stamped in attractive colors.

$1.50 net

At All Bookstores, or

THE JUDSON PRESS

1701-03 Chestnut Street

PHILADELPHIA, PA.

NATURE BOOKS

We have just published our

Annual Bargain List

of Standard and Rare Books relating to Birds, Insects, Plants, Animals, Exploration, Taxidermy, etc., fresh and unused copies. A large proportion of the items are offered at half price or less for this catalogue only.

Copy sent free upon application

FRANK WALTERS

NATURAL HISTORY BOOKS

520 Grand Central Palace

New York, N. Y.

Highly Decorative Gifts for Home or Office

A luxurious fur rug made by Jonas Bros. from Leopard, Tiger, Lion or Bear commands a special appreciation. It's different—it's useful as well as decorative.

We have a selection of mounted wild game heads that make splendid gifts.

Send today for our Free Art Catalog with pictures and price list.

JONAS BROS.

1023 Broadway **Denver, Colo.**

TWO FREE BOOKS

Breed squabs and make money. Sold by millions at higher prices than chickens. Write at once for two free books telling how to do it. One is 40 pages printed in colors, other 32 pages. Ask for books **three** and **four**. You will be surprised. **Plymouth Rock Squab Company, 704 H Street, Melrose Highlands, Massachusetts.** Established 26 years.

Flying Squirrels

Lovely pets as Christmas suggestion. $5.00 pair, express paid; booklet. Safe delivery guaranteed. Wildwoods Fur Farm, Woodville, Texas.

Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature

QUESTION: *Would you be able to furnish any information concerning the raising of muskrats in captivity?—M. C. H.*

ANSWER: We believe that the problem of raising muskrats in captivity has not been successfully developed. However, natural marsh areas stocked with the animals have been found to yield good returns.

QUESTION: *Do flies, grasshoppers and other insects continue to moult and increase in size after reaching the adult state?—J. R. M.*

ANSWER: Flies have a complete metamorphosis, and after once reaching the adult stage do not again moult or increase in size. Grasshoppers, however, hatch from the eggs in a shape resembling closely the adults, and thereafter pass through successive moults, and grow larger.

QUESTION: *Are cutworms and tobacco worms larval forms of some insects?—J. R. M.*

ANSWER: Cutworms are the larvae of some of the Noctuid, or owlet, moths. Tobacco worms and tomato worms are larvae of hawk moths, or sphinx moths.

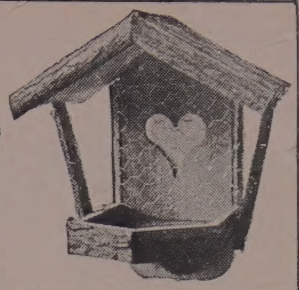
QUESTION: *Is amitosis and binary fission the same thing? As I understand it, the cells of the more complex organisms divide by the complicated process of mitosis, and the single-celled animals reproduce by amitosis or binary fission. Is this right? Or do some of the protozoa divide by mitosis?—R. S. V.*

ANSWER: Amitosis is the most common type of division; usually illustrated by follicle cells of cricket. It is a simple division of cell without formation of amphiaster. Binary fission is such as occurs in *Paramoecium* in which there is an elongated macronucleus; on fission each receives an equal amount of substance. Two complete individuals with gullet and other component parts are formed. Mitosis is a biological arrangement in which hereditary qualities are distributed in chromatin granules on a network in nucleus of a cell, and on migration of centrospheres or attraction spheres the nuclear wall breaks down and an amphiaster is formed which pulls chromatin (now chromosomes) to the equatorial plate where they split longitudinally, and each gets an equal share of chromatin material. It is believed that some forms of Protozoa may divide by mitosis. To be clearly understandable, this should be illustrated by a diagram.

QUESTION: *Will you please give me some information as to how to raise a flying squirrel?—L. P.*

ANSWER: If your flying squirrel is old enough to eat, it should be fed a variety of food, mainly vegetables, nuts, bread, seeds, fruit, and perhaps various insects. A flying squirrel is not as satisfactory a pet as some other species, owing to its nocturnal habits. Also they are very destructive if they escape in the house.

The Ever Popular CEDAR Bird Houses



Have a Heart Feeder No. 65
$2.60 each or 2 for $5.00
Unique Gray Squirrel House $6.00

Bluebird, Robin and Wren,
3 for $5.00 and Parcel Post charges.

CRESCENT COMPANY

"Birdville" Toms River, N. J.

BIRD FILLING STATIONS

Patented July 13, 1926

Feed the birds *NOW* and have them with you all winter.

—AUTOMATIC—
IMPROVED

Suet always clean and accessible to last particle.

No. 1, price $1.50
No. 1 to hang from tree or bracket.

For smallest home or largest estate. Every home should have several.

No. 2, price $1.25
For window casings, porch columns, etc.

POSTAGE PAID

LEWIS P. KELLY, R. F. D. 4, Dept. N, Peoria, Ill.

FEED the BIRDS

Use the **Packard Automatic Feeder.**

Keeps food dry, avoids waste, holds a quart, weighs (packed) 3 pounds, and costs $1 and postage. Why pay more?

Special Mixture Bird Food

Balanced ration. Nothing else like it: nothing else so good. 10 pounds, $2 and postage.

Everything For Wild Birds Catalogue Free

WINTHROP PACKARD

1433 Washington Street **Canton, Mass.**

GOLDFISH & CANARIES

ACCEPTABLE CHRISTMAS GIFTS

Send for Catalog describing our Goldfish, Aquariums, Birds, Cages, Stands, Pets, Plants, Amphibia, Supplies.

PUTNAM'S FISHERIES

501 Washington St. **Buffalo, N. Y.**

GOLD FISH

Imported Japanese and American Fish, Aquatic Plants, Castles, Globes, Food. We make artistic aquariums suitable for beautiful homes, conservatories, schools, etc. Illustrated circulars free.

PIONEER GOLD FISH CO., Racine, Wis.

WILD BIRD FOOD

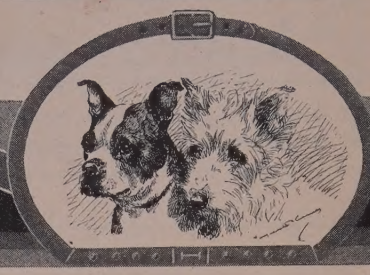
Now is the time to attract Winter Birds

Suet Cake will do it

35c a cake—3 cakes for $1.00. Suet cake holder, $1.25; Filled $1.50. Seed and nut mixture, 5 lbs. $1.10; 10 lbs. $2.00. XMAS Packet for the Bird Lover, $2.00. Postage paid on all goods.

PURITY BIRD STATION **RR Box 51, Northbrook, Ill.**

IN THE KENNELS



SCOTTISH TERRIERS

Beautiful young stock now ready for delivery. Price reasonable.

Loganbrae Kennels
Rutland, Vt.

Your Dog Wants *this* Food!

The healthy dog is the properly fed dog.

KEN-L-RATION is a scientifically balanced ration of meat, cereals and cod liver oil.

For sale by grocers, druggists, veterinarians, sport goods and department stores, feed stores and pet shops. Write us for FREE sample can.

CHAPPEL BROS., Inc.
1110 Peoples Ave. Rockford, Ill.

KEN-L-RATION
THE DOG FOOD SUPREME

MILLER'S A-1 PRODUCTS — Dog Care Simplified

"Old Timers" and new dog owners alike find our new dog book, "The Pink of Condition," full of valuable advice on care and feeding. Write for your copy and samples of food today.

Battle Creek Dog Food Company
1282 State Street Battle Creek, Mich.

Wenruth Kennel

The Home of Registered
COCKER SPANIELS

Puppies priced $35.00 up
Harding Way East Marion, Ohio

IRISH WOLFHOUNDS

Pedigreed Puppies For Sale

CHILLUM KENNELS

E. F. RIGGS, *Owner*
Green Hill Farm Hyattsville, Md.

SPRINGER SPANIELS

Several Nice Springer Spaniel Puppies For Sale
Prices Reasonable for Quick Sale.
Out of Meg of Avandale II. By Macnab (Imp.)
Information and prices on request.

JOHN POLLOCK
% G. R. FORD
Belmont Farm Perrysburg, Ohio

Schnauzers - Scottish Terriers

Imported adults and puppies, best of breeding, including 1926 and 1927 Jahresiegers as sires of the Schnauzers. Reasonable prices.

GLEN SHAGRIN KENNELS
Box 1D South Euclid, Ohio

English Bull Terriers

At Stud *Fee $25.00*

Ch. Nibrab Satan and Imp. Gladiators Repel

Puppies from these dogs, now ready to ship, are of the first class and eligible to be registered in the A. K. C.

JAMES G. BARBIN
1028 Tweed Street Pittsburgh, Pa.

Beautiful registered BULL PUPS, $15. Bulldogs, 501 Rockwood, Dallas, Texas.

Membership Nomination Blank

AMERICAN NATURE ASSOCIATION *WASHINGTON, D. C.*

ANNUAL DUES	
United States	$3.00 a year
Canada	$3.25 a year
Abroad	$4.00 a year

...., 1927

Secretary, AMERICAN NATURE ASSOCIATION,
1214 16th St., Washington, D. C.

I nominate for subscribing membership in the Association and to receive NATURE MAGAZINE:

.....

Address .....

.....

Name and address of
Nominating Member.....

.....

90% of the annual dues is designated for subscription to the magazine

THE MISSISSIPPI—
SERVANT OR TYRANT?

IN POLITICS the leaders at election time look for a paramount issue. In control of the Mississippi River, in which it is hoped no politics will enter, there is a paramount issue of the utmost importance to the Nation's welfare. The Mississippi Valley is the backbone of the country. Controlling Mississippi floods is therefore a straight business proposition, for 41 percent of the run-off of the United States goes into that valley. If the Nation's backbone is injured the whole country suffers. Why? Seventy percent of the farm implements is made there; eighty percent of the wheat comes from there; sixty-one percent of the cotton is grown there; seventy-five percent of the livestock comes from there. These figures are but an example of what the Valley means to the Nation's prosperity. These figures do not touch the Valley's buying power which as every one knows is greatly impaired in times of disaster.

The American Tree Association is just completing a survey of organizations on what action they are taking on Mississippi Flood control. This shows the General Federation of Women's Clubs through the conservation division will make the study of the problem a major project this winter. One of the first state organizations to take up the subject was Michigan Federation of Women's Clubs. Mrs. E. R. Latham has sent out a call for the General Federation to study the Flood Booklet of the American Tree Association. Another state organization to take action was the New York State Federation of Women's Clubs when in session at Syracuse. Mrs. Charles Cyrus Marshall of New York City, chairman of the Division of Conservation, prepared a resolution asking for the acquisition of lands for reforestation at the headwaters of streams and rivers.

In all parts of the country business organizations are alive to the flood menace, have appointed flood committees and are studying "Floods, Forests and the Future," published by the American Tree Association. This points out the need of reforesting the headwaters of the streams and rivers that find their way to the Mississippi. Calling the solution of the problem a national duty the Investment Bankers' Association of America in a resolution adopted at the sixteenth annual convention declared the economic welfare of the entire country was impaired by the loss of life and property resulting from periodical overflows. This action followed an address by Gov. John E. Martineau of Arkansas, who declared the flood problem was not local or sectional, but national. The Governor said that at least 10 percent of the 15,000,000 investors in the United States had investments in the Valley. At the Appalachian Power Conference in Chattanooga, Hon. John M. Parker, of Louisiana and R. W. Edmonds, editor of the Manufacturers' Record of Baltimore, set forth the need of flood control from the national prosperity standpoint, and for the future. On this point Mr. Edmonds said: "We must map out the most thorough system of reservoir control that can be considered feasible for twice our present population and several times our present use of rivers for navigation and irrigation, and then, unlike a private corporation, which can invest its money only with a view to fairly early dividends, we must spend liberally for our distant future."

Among leading educators Dr. E. H. Wilkins, president of Oberlin College, and Dr. W. P. Few, president of Duke University, have set forth constructive views on the importance of flood control. The editors of the nation are pointing out the importance of reforestation from the erosion standpoint. It is admitted that millions of dollars damage is done when the top soil is washed away. Our forests are great reservoirs that hold back rainfall. The trees break the force of storms. Forest floors, at the headwaters of streams, absorb thousands of tons of water, preventing erosion and floods. The thick carpet of leaves, needles, twigs, cones, seeds, and vegetation soak up water and feed it gradually to the rivers.

We have approximately 225,000,000 acres of logged off forest land that has not been taken for farming. Many of these forests, through destructive lumbering and fires, have been denuded, and many turned into worthless barrens off which the water rolls as though from a duck's back. Think of this vast 225,000,000-acre sponge reforested, with a thick litter on its shaded floor, soaking up tons of water, which must seep gradually through the earth to the rivers, instead of rushing pell-mell down the stream beds! Imagine the restraining power of such a great sponge in controlling floods!

No system of flood control that leaves out the forests can succeed. Levees, of course, will hold back floods to a fixed channel—while the levees hold. Artificial storage reservoirs will help. But unless we move for the natural storage of water such as forests provide, there always will be that tremendous rush of flood-tides following storms and the spring thaws.

The Revenge of the Forests

by Conrad Nies

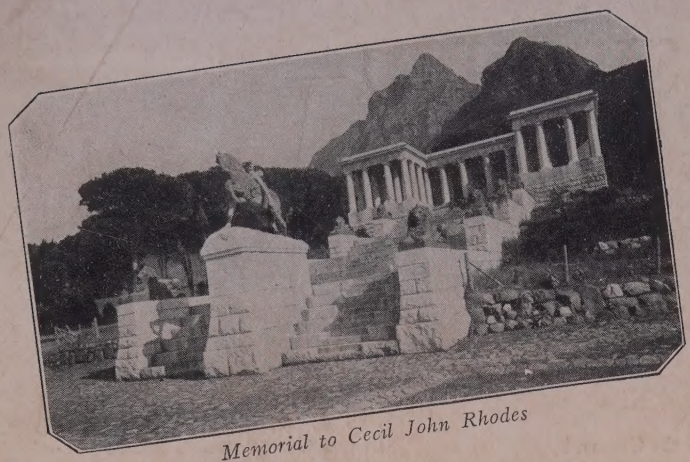
Translated from the German by
Prof. J. F. L. Raschen.

Through ages stalwartly we grew. We stood
On guard o'er redskins cowering.
Their shelter we, their arms, their food.
Our swaying majesty their land o'ertowering.

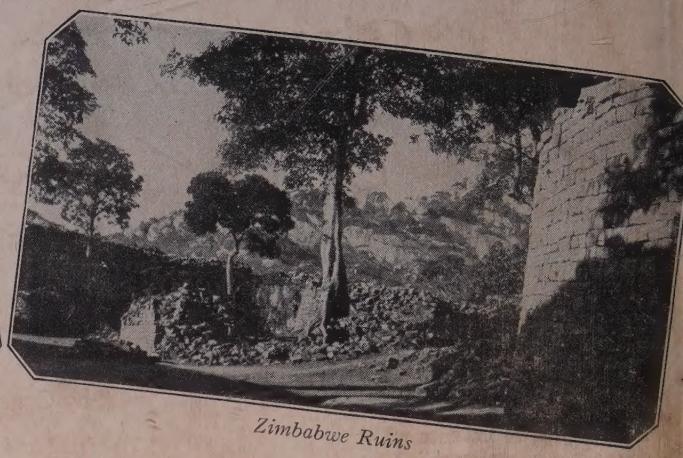
From Outre-Mer the Paleface came;
He broke the spell long sacred.
A thoughtless bungler he,—for shame!
With greed was foully cankered.
He smote us ancients staunch and true,
Aged sentinels on plains and lakes.
Nor aught, he, of our blessings knew.
In ruthless rage he felled us all,
To pile him GOLD in stakes!

Yet ere we dropped with ponderous fall,—
To serve his ends of greed,
Aloud to Rain and Storm did call:
"Avenge this ruthless deed!"

Rumbling and rushing with ominous sound,
Through canyons and valleys and plain,
Where waters assemble and low spots abound,
From the East to the West, with forces amain,
Sweeps the Vengeance the forests have sworn.
It never abates, it rides swift as the morn,
Appalling the toll it exacts.
For the waters, the fire, the wind and the flood
Take the toll for the forests once shorn.



Memorial to Cecil John Rhodes



Zimbabwe Ruins

The Travel Land of Sunshine

When winter rages at home—with falling snow that blankets city and country alike and driving sleet that chills your bones to the very marrow—visit

SOUTH AFRICA

The Land of Mellow Sunshine

There you will find beautiful flowers, primeval forests and sylvan glades, fresh, cool and restful—truly invigorating.

South Africa is a veritable fairy-land—a treasure country full of new and fascinating sights that charm even the most experienced traveler. You will see towering mountains, majestic waterfalls, beautiful rivers, modern cities, quaint native kraals, peaceful barbaric warrior dances, ancient ruins, glorious gardens and mighty game preserves. Thrilling, enjoyable.

As for travel, the South African Government Railways are internationally famous for comfort, speed, safety, convenience; dining and sleeping car service.

You can travel all the way to South Africa through warm climates—a number of de luxe tours have been arranged for this winter. Write for free booklet, "In the Track of the Sun", or send 12 cents (to cover postage) for fully illustrated travel booklets.

SOUTH AFRICAN TRAVEL BUREAU

Bowling Green Offices **11 Broadway, New York City**